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CIVIL DEFENSE

95-2 HEARING

BEFORE THE

COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS

UNITED STATES SENATE

NINETY-FIFTH CONGRESS

SECOND SESSION

ON

OVERSIGHT ON THE ROLE OF CIVIL DEFENSE IN THE UNITED STATES-SOVIET STRATEGIC BALANCE, THE EFFECTIVENESS OF EXISTING SOVIET AND UNITED STATES PROGRAMS, THE FEASIBILITY OF PASSIVE DEFENSES FOR THE SURVIVAL OF THE POPULATION AND THE ECONOMY

JANUARY 8, 1979

Printed for the use of the
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95th CONGRESS, 2nd SESSION

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CIVIL DEFENSE

MONDAY, JANUARY 8, 1979

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, D.C.

The committee met at 10:05 a.m., in room 5302, Dirksen Senate Office Building, Senator William Proxmire (chairman of the committee) presiding.

Present: Senators Proxmire, Lugar, and Schmitt.

OPENING STATEMENT OF CHAIRMAN PROXMIRE

The CHAIRMAN. The committee will come to order.

Eighteen years ago a national magazine published a chart showing how 160 million Americans would die in a nuclear war, yet only 5 million would perish if they built fallout shelters. In 1961, the budget contained $700 million for civil defense. Citizens were expected to spend an additional $30 billion on private shelters. Holes appeared in backyards across the country; holes which are now wine cellars and storage rooms.

Nonetheless, the same basic issues face us again today. What role does civil defense play in the "balance of terror"? How much should the United States spend on civil defense? How effective would it be? What are the Soviets doing and how effective is their program?

Should we try to match their activities? Will evacuation of our cities work? Why shouldn't we do everything possible to protect the lives of our own people? Isn't civil defense a small price to pay in the nuclear era if there is any real possibility it could save millions of lives.

The Carter administration studied several major issues in its recent civil defense review called "Presidential Review Memorandum 32." In recent months, the administration has examined the role of civil defense; the effectiveness of civil defense measures; what types of civil defense are most useful and how easily can these be overcome.

The answers to these questions resulted in Presidential Directive 41. This study was not without controversy. The State Department, Arms Control and Disarmament Agency, and OMB objected to some of the conclusions in the draft study for PRM 32, while the National Security Council, Joint Chiefs of Staff and Federal Preparedness Agency concurred. Six civil defense options were outlined for the United States ranging in price tag from almost nothing yearly to $60 billion over 5 years. I understand there was general agreement on a small increase in spending for civil defense but our witnesses today will be able to address that question more precisely.

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There is considerable confusion about this country's civil defense posture. Some think what we are doing now is totally ineffective. Some think we should be spending billions annually. Some argue for matching Soviet spending, which is about $2 billion a year—measured as if transferred to this country with our high manpower costs included. Some argue that any but the most limited spending on civil defense in an age of nuclear-assured destruction is foolish.

The signals from this administration are ambiguous. One day there is a leak stating that the U.S. policy will cost $2 billion over 5 to 7 years. The next week there is another leak that the budget will be increased from the present $97 million to $145 million. The following week the figure is down to $122 million and then $114 million.

We are here today to find out just what U.S. policy is, how much it will cost, and how effective it will be.

The committee is pleased to have the Honorable Paul C. Warnke as our first witness. Mr. Warnke's Arms Control and Disarmament Agency made a major contribution to PRM 32 and PD–41. ACDA also has published an authoritative analysis of civil defense in nuclear war. No one is in a better position to assess the importance of civil defense as it applies to the SALT II negotiations than Mr. Warnke. And I will add that this Senator wishes to express his appreciation to Mr. Warnke for the great service he has made to our country under difficult circumstances.

The committee today will hear from a number of other witnesses whom, taken collectively, represent a remarkable depth of expertise on civil defense.

This committee conducts this hearing under the authority of the jurisdiction of the Joint Committee on Defense Production, whose oversight responsibilities were transferred to the Banking Committee under Senate reorganization last year.

Senator Schmitt?

OPENING STATEMENT OF SENATOR SCHMITT

Senator SCHMITT. Mr. Chairman, just one or two remarks to welcome our distinguished witness, and also I find it intriguing to suddenly realize that this is part of our jurisdiction on this committee. I guess I knew that, and it had slipped my mind.

Of course, we have all sorts of strange jurisdictions, it turns out, that become more and more interesting as the years go by.

I think one of the most significant aspects of a discussion of civil defense—whether we decide in this country to do anything significant in that area or not—is the psychological ramifications of civil defense in any nation:

One, if there is a possibility of war, the degree of preparedness with respect to civil defense gives some indication of the national belief, or at least a belief by the leadership, or whether war is likely or not, and to what degree there is a likelihood of war.

And second, it seems that it would reflect the belief in a capability of national survival in the event that there is a war. Something we have to remember with respect to the Soviet Union's efforts, whatever we may do ourselves, is that: In an extensive development of a civil

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defense capability, there appears to be (1) a greater belief in the likelihood of war on the part of the Soviet leadership; and (2) a greater belief in their survival in the event of such a war—a nuclear war.

And so we must keep that in mind, whatever else we may do. That must weigh in our discussions of the SALT Treaties; it must weigh in our discussions of our own defense preparedness. It is also important to recognize that there are various ways of providing for civil defense. One, of course, is the shelter concept, however it may be expanded or reduced. The other is providing for defensive systems—military systems—that provide effectively the same survival capability. I think it is clear that, in defense systems, our research and development in this country is not what it should be. It could be much greater without significantly impacting the civil sector other than in the financing of such research and development efforts.

So I will look forward to Mr. Warnke's comments, and the comments of our other witnesses today, with those very general psychological and maybe even philosophical thoughts in mind.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Schmitt.

I should point out that, as you may recall, the Joint Committee on Defense Production was really an outgrowth of this committee. I think the argument behind it was: While this isn't the Armed Services Committee or the Foreign Relations Committee, it is a committee that has a great responsibility for the economy of the country.

And the feeling was that, I think, on the part of those who decided on this jurisdiction, that civil defense was not only a great military problem, but also a profound economic problem with great economic impact, including any substantial preparation for effective civil defense.

I might just point out that, in 1976, the committee launched a review of civil defense which resulted in 5 days of hearings, and led to a series of reports which were made, and the conclusions led to the introduction of S. 1209, a bill to reorganize the Federal Emergency Preparedness and Disaster Assistance Agencies.

In addition to this recent activity, the departments and agencies have been submitting reports on their Defense Production Act programs and emergency preparedness and mobilization activities to the Joint Committee on Defense Production since 1951.

Mr. Warnke, we are happy to have you as our first witness.

STATEMENT OF PAUL C. WARNKE, PARTNER IN WASHINGTON LAW FIRM OF CLIFFORD, GLASS, McILWAIN, FINNEY; FORMER DIRECTOR OF ARMS CONTROL AND DISARMAMENT AGENCY; AND FORMER CHAIRMAN OF SALT DELEGATION

Mr. WARNKE. Thank you, Mr. Chairman.

I very much appreciate the invitation to appear today, and I am most appreciative of your generous comments.

I have been asked to address the role of civil defense in the United States-Soviet strategic balance. This, of course, is a separate question from the question whether civil defense might have some effect in sav-

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ing some lives, and perhaps in increasing the survivability of our Government.

I will not address those other questions. I will confine myself to "The Role of Civil Defense in the Strategic Balance between the United States and the Soviet Union."

In considering that question, I believe it is necessary first to examine the nature of the balance as it presently exists. The strategic balance is now characterized by stability, by which I mean that neither side could give serious consideration to initiating a strategic nuclear war because of the certainty that that would provoke a retaliatory response which would destroy the attacker's society. There is now a situation of mutual deterrence.

That, of course, is the objective of the SALT talks: To preserve that strategic balance, and to see to it that the United States and the world are moved further away from the risk of strategic nuclear war.

Now hypothetically, the bringing into being of strategic defenses could destabilize the strategic balance by making impossible the type of retaliatory nuclear strike that would inflict unacceptable damage on the aggressor.

If it were possible for either side to protect its people, its facilities, and its industry—whether by antiballistic-missile systems and air defense or by sheltering its population or evacuating it, and hardening and dispersing its industry—then adequate deterrence no longer would exist.

It was the recognition of these implications of strategic defense that led to the beginning of the SALT talks. Initially the objective was to negotiate limits on antiballistic-missile systems.

And in 1972, as we will all remember, the two countries signed a treaty which limited each side to the deployment of antiballistic-missile defenses at no more than two locations. And then, by subsequent amendment, the treaty cut back the ABM deployments to one system at one location on each side; and then subsequently, we concluded that because of the futility of the attempt at defense, we would deactivate even the one system that was permitted to us.

Now it is only in the crazy logic of strategic nuclear weapons that you would consider that limitations on defense could be regarded as consistent with national security interests.

Senator Schmitt has mentioned the desirability of continuing research and development on possible defenses. I agree with that. I think that we should explore the possibilities. That protects against surprise from the other side, and perhaps at some point technological innovation might make practical defense possible. But the fact is that the existing technology did not provide for effective antiballistic missile systems; that no such defense is presently available; and that, accordingly, the deployment of extensive antiballistic missile systems on both sides could only create incentives to increase the number of offensive warheads. Rather than providing an effective defense, it might destabilize the strategic balance by lending a further incentive to the offensive nuclear arms race—because present technology can provide whatever number of warheads is necessary to overwhelm and thus penetrate whatever number of antiballistic missiles are deployed.

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The treaty limiting antiballistic missile systems thus protects strategic stability and makes unnecessary the further accumulation of offensive weapons to neutralize and nullify the deployed ABM systems.

Now I think that the question of civil defense and its role in the United States/Soviet strategic balance has to be examined in the same light and against the same criteria. If one side were able to bring into being a civil defense that would fend off unacceptable damage to its people and property while the other side did not, then the strategic balance would be destroyed and the deterrent efficacy of the side without an adequate civil defense would be eliminated.

If both sides were capable of creating genuinely effective civil defense systems, then of course strategic nuclear weapons could be substantially defanged.

But the fact is that neither side can provide significant protection through civil defense; and that therefore civil defense has no significant role in the strategic balance.

Now I recognize that there are those who say that, even today, the Soviet Union has developed a civil defense system that permits it to contemplate the possibility of fighting, surviving, and winning a strategic nuclear war; and that, as a consequence, we must match this Soviet development or else face a situation in which our strategic deterrent is eroded.

I am convinced that this is not the case in fact; that no measures are now available to afford protection against devastation of both countries as a result of a strategic nuclear exchange; and that therefore the real danger that civil defense poses to strategic stability would come from an indulgence in the illusion that effective civil defense is presently possible.

Now against this background, I would like to address the strategic role of civil defense in two contexts: the one "actual": What would in fact happen to our and to Soviet society as a consequence of a strategic exchange, and no matter what civil defense measures might be employed.

The second is "perceptual." As Senator Schmitt mentioned, the psychological aspect of civil defense cannot be ignored. We have to consider what any disparity in United States and Soviet civil defense programs may mean in terms of the perception of the strategic balance.

It appears to be the fact that the Soviet Union has a civil defense program presently which is appreciably more substantial than that now pursued by the United States.

Although the Soviet program—according to our intelligence estimates—accounts for less than 1 percent of the estimated Soviet defense budget, it employs some 100,000 military and civilian personnel and it would cost us about $2 billion a year to duplicate it.

As you pointed out, Mr. Chairman, because of the much lower manpower costs in the Soviet Union, their actual expenditure is only a fraction of that amount—approximately 25 percent, or some $500 million a year. But that is much more than we presently spend, more than 5 times.

The Soviet program involves both hardened underground shelters and evacuation plans, as well as plans for the protection of industrial facilities.

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But as the Director of Central Intelligence's study indicates, as well as the study of the Arms Control and Disarmament Agency, the Soviet Union cities are more densely populated than those of the United States, and of course the Soviet Union has nothing comparable to our highway system or our high ratio of private cars to population.

Inplace shelters are no protection against the blast and heat that would blanket the city limits in a nuclear attack. Those who might survive the initial effects would be faced with starvation if they remained in the shelters, or fatal levels of radiation if they were to leave when stocks of food and water had been depleted.

And our studies indicate that a retaliatory strike by the United States after a Soviet first strike would kill between 70 and over 100 million people within the Soviet Union by the initial effects of blast and heat alone.

It should be noted that in our studies we always quite naturally hypothesize the situation in which the Soviet Union would strike first. We regard our strategic nuclear forces as a deterrent against Soviet attack, so that we calculate this on the basis of worst case analysis with the Soviet Union striking first.

Now in addition to the initial effects, some uncountable additional millions would die from delayed effects or the unavailability of medical care. It should be pointed out that, in a retaliatory strike by the United States, 80 percent of the urban Soviet hospitals would be destroyed, along with 80 percent of all Soviet cities with populations in excess of 25,000.

The Soviet Union's civil defense program appears to emphasize evacuation, but that again is no answer in terms of avoiding unacceptable damage.

Subway systems don't take the people outside the environment of burnout and intense radiation. And if significant numbers were to get to rural areas, they would find there neither the places to stay nor the means to assure their survival. The countryside itself would be strained to support many more people with much less, because of a devastated food supply and food distribution system.

Our present strategic forces have well in excess of 9,000 individual nuclear warheads, and that number is growing every day. The Soviet Union has less than that, but still a quite adequate number—in excess of 5,000. And those, too, are steadily growing in number.

With the quantity and the diversity of the delivery systems that both sides have available, either side could adopt whatever targeting pattern might be calculated to emphasize greater human damage, or any other particular element in the destruction inflicted on the other side.

Now against these inescapable facts, I believe it is meaningless to speculate about possible discrepancies in relative fatalities. No rational leadership could subject its country to the unexampled devastation that would be the sure punishment for the monstrous crime of launching a strategic nuclear war.

And as a practical matter, civil defense—with any measure that is presently available to either side—could have no actual debilitating impact on the retaliatory capability of the side that was attacked.

I think in the final analysis, we have to consider what "deterrence" consists of. What deters an aggressor is the certainty that unacceptable

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damage will be done to him. It does not rest on his speculation about the extent of the damage that he might do to his opponent. And as I see it, deterrence is not diminished by the possibility that the side that strikes first might win some meaningless victory in terms of a body-count contest.

I would like to turn to the second context, which is that of perceptions of the strategic balance. And here, too, I must conclude that the role of civil defense is not a significant one unless we fool ourselves into making it something of significance.

We must recognize that perceptions of the strategic balance do not necessarily coincide with the actual strategic balance. And we must recognize that deterrence is a matter of perceptions. We have to have both the retaliatory capability that will in fact be able to inflict unacceptable damage, and we must be seen to have that adequate retaliatory capability.

At the present time, as I have indicated, I think there is no question of the fact that, with the existing and foreseeable strategic balance, the Soviet Union has to recognize the futility of any civil defense effort as a means of protecting the Soviet population, industry, and infrastructure from an American retaliatory strike.

They can't believe that any present or prospective shelter program, or any hopes of speedy evacuation, would in fact spare them from the unacceptable damage that would be done by our retaliatory strikes.

And we should not delude ourselves that Soviet evacuation programs might lead them to feel that by evacuating the population they would be able to spare them from the damage of an American retaliatory strike.

So then we left with the question that always arises, which is: If in fact their civil defense effort is not adequate to protect them from unacceptable damage, why are they spending, in Soviet terms, some $500 million a year? Why is it that they feel this is a worthwhile expenditure?

It is always difficult, I have found, to speculate as to Soviet motives. Instead, I think we have to rely on an analysis of what the factual situation is.

If civil defense, however, were an important integral component of a Soviet view of a sensible strategic balance, then the question would not be why they are spending so much, but rather why they are spending so little. Even $500 million a year is a relatively miniscule expenditure in terms of the immensity of the problem.

If in fact it were an important part of the strategic balance in their view, we would find more evidence of industrial dispersion. We would find more evidence of a program that existed in practice, rather than largely on paper.

One possible explanation, of course, is that a manpower intensive program is not the burden on them that it is on us. Their manpower costs are less; they have less useful alternatives for many of their people: and also we have to keep in mind the fact that, fortunately, the military threats that are faced by the Soviet Union are more numerous and more complex than those that we face.

We have a single military threat, which is that posed by the Soviet Union. And I think that we ought to recall that, back in 1967 when we

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first contemplated antiballistic-missile deployment, we did so with the rationalization that, whereas it could not protect us against the massive Soviet strategic forces, it might give us a measure of protection against the expectable Chinese threat.

Today, we don't worry much about the Chinese threat. The Soviet Union must worry about it, and does.

In conclusion, Mr. Chairman, I believe it is unrealistic and potentially destabilizing to consider that civil defense can play any genuine, significant part in the strategic balance; and any conclusion that we should seek to match whatever it is that the Soviet Union maybe does in this field could lead only to a mindless race in this area.

The result of that race would be, I fear, less stability at a time of crisis. Instead of trying to match the Soviet civil defense program, I think our priority ought to be placed on the SALT negotiations and completing a SALT II agreement, and going ahead with further strategic arms agreements that will insure that the strategic balance that prevents nuclear war is in fact preserved.

As part of that ongoing SALT process, we might consider whether limitations on civil defense ought to be built into it, just as we have limitations on antiballistic-missile defense.

Now that doesn't mean that I am opposed to some modest program that might provide some measure of insurance against the unlikely but nonetheless dread prospect that deterrence might fail.

For that purpose, some exploration of possibilities of improving evacuation techniques may be justified; but this should not be seen as a necessary component in the overall strategic balance—but, instead, as a means of perhaps somewhat lessening the human fatalities, and perhaps contributing to the survival and revival of some form of governmental system.

Thank you, Mr. Chairman.

[Complete statement of Mr. Warnke follows:]

STATEMENT OF PAUL C. WARNKE ON "THE ROLE OF CIVIL DEFENSE IN THE U.S./SOVIET STRATEGIC BALANCE"

In considering the role of civil defense in the strategic balance between the United States and the Soviet Union, it is necessary first to examine the nature of that balance as it presently exists. The strategic balance is now characterized by stability, by which I mean that neither side can contemplate obtaining advantage by initiating a strategic nuclear war because of the certainty that the aggressor would provoke a retaliatory attack which would destroy his society. There is now a situation of mutual deterrence.

Hypothetically, the bringing into being of strategic defenses could destabilize the strategic balance by making impossible the type of retaliatory nuclear strike that would inflict unacceptable damage. If either side could protect its people, its facilities and its industry—whether by antiballistic missile systems and air defense or by sheltering and evacuating its population and hardening and dispersing its industry—adequate deterrence might no longer exist.

Recognition of these implications of strategic defense led to negotiation between the United States and the Soviet Union to limit severely the deployment of antiballistic missile systems. In 1972, the two countries signed a treaty limiting each side to the deployment of antiballistic missile defenses at no more than two locations. Subsequently, the treaty was amended to cut back the number of ABM sites to one per side.

It is only because of the dire logic of nuclear weapons that limitations on defense can be regarded as consistent with national security interests. But the fact is that no effective antiballistic missile defense is available and that, accordingly, deployment of antiballistic missile systems would only create incen-

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tives to increase the number of offensive warheads. Present technology can provide whatever number of warheads is necessary to overwhelm and thus penetrate whatever number of antiballistic missiles is deployed.

The treaty limiting antiballistic missile systems thus protects strategic stability and makes unnecessary the further accumulation of offensive systems to nullify ABM deployments.

The question of civil defense, and its role in the U.S./Soviet strategic balance, must be examined in this same light and against the same criteria. If one side were to bring into being a civil defense that would fend off unacceptable damage to its people and property, while the other side did not, then the strategic balance would be destroyed and the deterrent efficacy of the side without an adequate civil defense would be eliminated. If both sides were capable of creating genuinely effective civil defense systems, then, of course, strategic nuclear weapons could be substantially de-fanged.

There are those who urge today that the Soviet Union has in fact developed a civil defense system that permits it at least to contemplate the possibility of fighting, surviving and winning a strategic nuclear war and that we, as a consequence, must match this development or else face a situation in which our strategic deterrent is eroded. I am convinced that this is not the case in actuality, that no measures are available to afford protection against devastation of both countries as a result of a strategic nuclear exchange and that the real danger that civil defense poses to strategic stability comes from indulgence in the illusion that effective civil defense is possible.

Against this background, I propose to address the strategic role of civil defense in two contexts—the one actual, that would in fact happen to our and to Soviet society as a consequence of a strategic exchange, whatever civil defense measures might be employed; the other perceptual, what any disparity in U.S. and Soviet civil defense programs may mean in terms of the perception of the strategic balance.

It appears to be the fact that the Soviet Union has a civil defense program appreciably more substantial than that now pursued by the United States. Although the Soviet program accounts for less than 1 percent of the estimated Soviet defense budget, it employs about 100,000 military and civilian personnel and would cost us about $2 billion a year to duplicate. The much lower manpower costs in the Soviet Union means that their actual expenditure is only about one-quarter of that amount.

Moreover, the Soviet program involves both hardened underground shelters and evacuation plans, as well as plans for protection of industrial facilities.

But Soviet cities are more densely populated than those of the United States and the Soviet Union has nothing comparable to our highway system and ratio of private cars to population. In-place shelters are no protection against the blast and heat that would blanket the city limits in a nuclear attack. Those who might survive the initial effects would be faced with starvation if they remained in the shelters or fatal levels of radiation if they were to leave when stocks of food and water had been depleted.

Studies indicate that a retaliatory strike by the United States after a Soviet first strike would kill 70–100 million people within the Soviet Union by the initial effects alone. Uncountable additional millions would die from delayed effects or the unavailability of medical care. Eighty percent of urban Soviet hospitals would be destroyed along with 80 percent of all Soviet cities with populations above 25,000.

Evacuation would be no answer. Subway systems could not take the people outside the environment of burn-out and intense radiation. If significant numbers were to get to rural areas, they would find neither the places to stay nor the means to assure their survival in a countryside strained to support millions more with much less.

In our present strategic forces, we have more than 9,000 individual nuclear warheads and the number is increasing every day. The Soviet side has some 5,000 and these are also steadily growing in number. The quantity and the diversity of the delivery systems means that either side can adopt whatever targeting pattern might be judged to magnify the agony inflicted on the other side.

Against these inescapable facts, it is, I submit, meaningless to speculate about possible discrepancies in relative fatalities. No rational leadership could subject its country to the unexampled devastation that would be punishment for the monstrous crime of initiating a strategic nuclear war. As a practical matter, civil

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defense can have no actual debilitating impact on the retaliatory capability of either side.

In the final analysis, what deters an aggressor is the certainty that unacceptable damage will be done to him—not his speculation about the extent of the damage he may do his opponent. Deterrence is not diminished by the possibility that the side that strikes first may win a marginal victory in the body count contest.

Viewed in the context of perceptions of the strategic balance, I must also conclude that the role of civil defense is not a significant one—unless perhaps by self-deception we may make it one. Perceptions of the strategic balance admittedly may not coincide completely with the actualities of nuclear weapons. It may be that far fewer nuclear delivery systems than we now have would be sufficient to destroy the other side even after its first strike. But the retaliatory forces must not only be adequate in fact, they must be seen to be adequate. Deterrence itself is, after all, a matter of perception and, so long as it works, the actual consequences of a nuclear exchange will remain mercifully a matter for theorists.

There can, in my opinion, be no question of the fact that the Soviet leadership must recognize the futility of the Soviet civil defense effort as a means of protecting Soviet population, industry and infrastructure. The Soviets cannot be judged as so blind and so reckless as to assume that any present or prospective shelter program or any fond hopes of speedy evacuation to safe zones may make it possible for them to utilize strategic nuclear war as a means of achieving political objectives.

Nor should we allow ourselves to be deluded by the prospect that a Soviet civil defense effort can largely neutralize our deterrent and thus destabilize the strategic balance. The warning and lead-time necessarily involved in any attempt to evacuate urban populations would, in the time of intense crisis in which it would occur, be provocative to the point of foolhardiness. And even the successful evacuation of as much as 80 percent of the urban population could be offset by a simple adjustment of targeting patterns to maximize fatalities.

The question that may be left by this analysis of the insignificance of civil defense to the strategic balance is why, then, the Soviet Union continues with its program. As is always the case, the concern is expressed that, because they do so, they must believe that it is good for them and bad for us. Perhaps, some will assert, Soviet thinking about deterrence is very different from ours and nuclear war is viewed as a feasible option with civil defense an important component in assuring a net advantage.

But if this conjecture were an accurate reflection of Soviet strategic doctrine, the remarkable feature of the Soviet civil defense effort would be the smallness of its size rather than its magnitude. Certainly much more of it would exist in fact rather than only on paper. Much more evidence would be found of industrial dispersal and hardening.

A partial explanation for Soviet willingness to utilize larger numbers of personnel for civil defense is the lower cost of manpower in the Soviet Union and lesser availability of more useful alternatives for its employment.

It should also be kept in mind that the military threats faced by the Soviet Union are, fortunately, more numerous and more complex than those that we face. You will recall that the initial rationalization for our limited ABM development was that, whereas antiballistic missiles could not provide protection against a heavy Soviet attack, they could provide a measure of protection against the expectable Chinese threat or an accidental launch. The same might be said for civil defense programs.

In conclusion, I believe that it is completely unrealistic and potentially destabilizing to consider that civil defense can play any genuine part in the strategic balance. Any conclusion that we should seek to match whatever it is that the Soviet Union may be doing in the civil defense field could lead only to a mindless race in this area, with the result being a diminution of stability in time of crisis. Instead, we should explore possible limitations on civil defense as a part of the on-going SALT process.

As some modest insurance against the dread danger that deterrence may fail, some modest program aimed at improving evacuation techniques may be justified. But this should be seen as a means of saving, perhaps, a somewhat greater number of lives and increasing the chance that some government may survive to help alleviate the chaos. But these reasons for continuing to fund something like the present civil defense program should not be distorted into a rationalization for a major expansion of civil defense as a necessary component in the overall strategic balance.

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The CHAIRMAN. Thank you very much, Mr. Warnke, for an excellent, very logical statement. At the same time, there are some elements here that trouble me somewhat. You indicate that what we should be working toward is a balance, as you say, a strategic balance. And yet, you admit that the Soviet Union in real terms is spending 20 times as much as we are in civil defense, $2 billion, if translated into our effort, compared to $100 million that we are spending now; 20 times as much, and that is not much of a balance.

Then you ask—or you answer the question that is obvious: Why are they doing this if they feel that it is not something that could provide any really effective protection? And your answer there does not satisfy me at all. You say that a partial explanation for Soviet willingness to use large numbers of personnel for civil defense is the lower cost of manpower in the Soviet Union and the lesser availability of more useful alternatives for its employment.

Now, everything I heard about the Soviet Union is exactly the opposite. They desperately need their manpower. They have virtually no unemployment and have not had unemployment. We have 6 million unemployed in this country now, almost 6 million. So we are the ones who have the available manpower with no useful alternative for their employment. It's true we have an inflation problem that very greatly complicates things, but the Soviet Union is weak in the farm area, the industrial area, and other areas, because they can't concentrate and use the manpower that is available.

How do you justify that explanation you have, that the cost of manpower in the Soviet Union—or rather, the availability of manpower in the Soviet Union is greater?

Mr. WARNKE. Well, I would say, Senator Proxmire, first of all, that I think we ought to view their expenditure in terms of what it costs them, not in terms of what a comparable program might cost us. The burden on them is more in the nature of $500 million, which would be something like 5 to 6 times our program rather than 20 times. I believe also that the reason why they have no unemployment is because of the nature of their society.

The CHAIRMAN. Now, wait a minute. I don't think you can slip away quite that easily, Mr. Warnke. You say that it would be $500 million because it is $500 million in their terms. I'm not sure that I understand that that would be the way. Their gross national product is half of ours.

Mr. WARNKE. Approximately, that's right.

The CHAIRMAN. So why wouldn't you then at least—let's compromise and say it is about $1 billion in our terms, rather than $500 million, as you are saying.

Mr. WARNKE. That would be one way of looking at it. Of course, it is awfully difficult to find any sort of rational comparison between Soviet expenditures and ours. That is one of the reasons we have always had difficulty in measuring the Soviet defense effort and why our estimates have been revised consistently.

But I would say one of the reasons why there is no unemployment is because they do in fact have the capacity, being the kind of society they are, to keep people involved in busy-work, and I regard this civil defense program as being in very large part busy-work. I think

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that one of the phenomena that has always been pointed out by visitors to the Soviet Union is the empty-truck phenomenon, where the roads in the Soviet Union seem to be filled with people driving empty trucks back and forth. Now, I would say this is a similarly productive use of manpower.

The CHAIRMAN. Well, again, I don't want to harp on that because it is a little aside from the point. But I think the busy-work is a result of inefficiency, incompetence, and errors on their part, because they certainly have enormous needs, which are being filled in part by greater utilization of their manpower.

But let me get back to the principal issue here, the balance between the United States and the Soviet Union. As I say, you say it's 5 to 1 and I say it's 20 to 1. Whatever it is, it is obvious that we could have a very substantial increase in our civil defense effort and simply be balancing theirs and nobody could construe that as provocative, or as providing a degree of civil defense that would destabilize the balance between the two great powers; is that correct?

Mr. WARNKE. I have not suggested that an increase in our civil defense program would be provocative or would destabilize the strategic balance.

The CHAIRMAN. Well, I thought I heard at the beginning of your remarks that you said it might be.

Mr. WARNKE. What I was trying to say, Senator, and perhaps I didn't do it very clearly, is that if there were to be a race in civil defense between the Soviet Union and the United States, that that could potentially be destabilizing. If, for example, both sides were to engage in massive evacuation drills, it seems to me that that would have to be a factor that would intensify any sort of a crisis.

The CHAIRMAN. But you would agree that if we increase our civil defense effort fivefold or so, that that would not be provocative?

Mr. WARNKE. Senator, I think we could adopt your measure and make it 20 times, and it would not destabilize the strategic balance. Since I am now in the private sector, it would offend me as a taxpayer.

The CHAIRMAN. The most powerful argument, perhaps, with many Americans, including this American, is that evacuation in some circumstances and other civil defense efforts could save the lives of millions of people. Now, none of us regard a nuclear war as unthinkable. Unfortunately, it is a real possibility. Why wouldn't it be a good insurance program for us to have a much more substantial civil defense effort if, in the event, whether it is 1 in 10 or 1 in 20, whatever it is, we should have a nuclear war, you then have the prospect of saving millions of lives.

Mr. WARNKE. Well, Senator, I would not disagree with that, and that is why I was careful in the beginning of my statement to separate out the question of the role of civil defense in the overall strategic nuclear balance from such issues as whether or not the civil defense effort might be justified as a means of savings lives. And I think that they are separate questions, because as I see it, as I tried to say in my opening statement, deterrence is based on the damage you can do to the other side, and as long as you have the retaliatory capability to inflict unacceptable damage on the other side, then the question as to whether 100 million Americans die or 70 million is not relevant to the strategic balance, it is not relevant to deterrence.

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It certainly is highly relevant to the 30 million Americans who might be saved. So that I would suggest that what we ought to determine is whether in fact some more comprehensive civil defense program might hold some genuine promise of saving substantial numbers of lives. I am not clear that that sort of study has been made. We have, of course, the studies that have been made by the Director of Central Intelligence and by the Arms Control Agency.

The CHAIRMAN. Well, if you're not clear that the study has been made, Mr. Warnke, I don't think the study has been made, because I think you are probably one of the best informed people, certainly, in this country in that area. Don't you think we should make that kind of a study. Do you think we have an obligation to our people to make it? Some people argue we have a constitutional mandate, we have no alternative. If we're going to follow the Constitution, we should provide for the protection of our people to this extent under the present circumstances.

Mr. WARNKE. I believe, Senator, that just as any other defense expenditure, it depends upon the conclusion as to whether this would in fact be effective. The studies that have been made, I believe, have focused on the immediate effects of a strategic nuclear exchange. Now, considering whether or not evacuation would save millions of lives requires that you consider, I think, in much more detail, what the lasting effects of that strategic exchange might be, what would happen in terms of fallout, whether or not any sort of evacuation would give any continuing protection over a period of months.

The CHAIRMAN. Every chart I've seen—maybe the charts we have been presented with are not reliable, but the charts I've seen indicate that an evacuation plan would save several million American lives.

Mr. WARNKE. I believe that is in terms of what the immediate effects of blast and heat would be, but that doesn't factor in completely what could happen in the event of changes in the targeting pattern which could offset those evacuation programs or what the effect would be of fallout, what the effect would be in terms of devastation to the countryside, whether in fact you would be able to keep those people alive after they had been evacuated.

All of this is something that has to be taken into consideration in determining whether or not the expenditure of additional billions of dollars is in the interest of the United States.

The CHAIRMAN. I want to get back to this a little later. Let me ask you another question. Dr. Huntington, in his prepared statement says, and I quote: "during the next several years, the Soviet Union will have significant advantages vis-a-vis the United States in two key sectors of the overall strategic balance. First, the Soviets will have the capability to destroy a major portion of the U.S. ICBM force in a first strike, while the United States will not have a comparable capability vis-a-vis the Soviet Union.

"Second, that the Soviet Union will have a substantial civil defense program which could, through a combination of shelters and evacuation, provide protection for Soviet leadership and the overwhelming majority of Soviet citizens in the event of a nuclear confrontation. The United States will not have a comparable capability.

"These two imbalances in the strategic equation interact with and reinforce one another. An American President would not be in an

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enviable bargaining position if the U.S. ICBM force is vulnerable to a Soviet first strike, if the Soviet leadership and population were substantially protected against a U.S. second strike, and if the U.S. leadership and population were highly vulnerable to a Soviet third strike."

Now, do you agree with Dr. Huntington's assessment on Soviet advantages in the next several years?

Mr. WARNKE. I would agree with Dr. Huntington's evaluation that if in fact our retaliatory forces were vulnerable and theirs were not, and they had a civil defense program that could in fact protect them against our second strike, that we would be at a distinct disadvantage. But that is not the fact. The fact is that our retaliatory capability is not in jeopardy. None of the studies that have been conducted would indicate that it was in jeopardy. We have just as much ability to develop a counterforce capability as the Soviet Union. As a matter of fact, our technology is superior. And their civil defense program would not in fact protect against a retaliatory strike.

The CHAIRMAN. Well, my time is up. But let me just say that what bothers me is the assumption that you made to begin with, that we have to assume that we are not going to initiate the first strike, that if the Soviet Union does initiate that first strike, that first strike gives them a very big advantage. Whoever initiates the first strike has the advantage, clearly. And also, at the same time as they initiate the first strike, they evacuate their cities. It is that combination that haunts me and haunts many others.

Mr. WARNKE. Well, Senator, what I said is that our studies assume that the Soviet Union has in fact struck first, and we have to proceed, it seems to me, on that assumption, in order to measure what our retaliatory capability is. Now, I doubt if the Soviet Union makes that same assumption, and I think that they would have to recognize that extensive evacuation of the population in a time of crisis might in fact be regarded by us as so awesome a phenomenon as to lead to our striking first, because we would be sure that they were in fact preparing to strike.

Now, that is one of the reasons why civil defense could in fact be destabilizing in a time of crisis. With regard to the vulnerability of the respective forces, I would point out that something in excess of 70 percent of the Soviet strategic forces are in the intercontinental ballistic missiles, which are potentially vulnerable. Because of our recognition of this potential vulnerability, we have seen to it that our forces are diversified, so that we have spread our resources evenly over the intercontinental ballistic missiles, the ballistic missile submarines, and the strategic bombers. So that I would feel that we are in a position of greater confidence than the Soviet Union, because we had the foresight to recognize that ICBM's were potentially, hypothetically, at least, vulnerable.

The CHAIRMAN. Senator Lugar?

Senator LUGAR. Mr. Warnke, during your testimony you mentioned that trying to determine motivation of the Soviet Union or at least its leadership is very difficult, and, in fact, may be impossible. But clearly, this is at the heart of the public interest in the civil defense issue, as there are many Americans who would believe that the Soviet

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Union has increasingly spent a great deal more of its gross national product annually, which has resulted in a large buildup of arms over a number of years.

Even though the figures may become rubbery, this appears to be that general perception, and one must question why this might be the case.

You have suggested in public testimony on many occasions certain reasons for this rapid buildup, and this has been a field of your study and endeavor. But the civil defense issue comes on top of this, because there appears to be, in the minds of many Americans, the thought that the Soviet Union is engaged in a military buildup, that there is some momentum to this buildup, and that it is not a casual affair, but one that seems to be sustained by a great deal of national will and dedication. Even if there were not a national will and momentum, there is a perception on the part of many countries, or the leadership of them, that there is such will and momentum.

Now, when on top of this it appears that the Soviet Union is devoting moneys that are substantial, as a part of their gross national product, to civil defense, it is bound to raise some questions.

It appears to me that you have suggested that the civil defense program offers a way of providing full employment. In other words, it is a manpower project of sorts that is not all that expensive, and as a marginal use of excess personnel in the Soviet Union offers a bit of construction which in fact keeps people employed. Essentially, it seems to me that that is the basic thrust of the reason why, in other words, they are proceeding in this manner. Unless there is great pressure on the part of persons somehow making their feelings known to the Soviet leadership that they want protection or that they want their government to look out for them, it is unclear why this amount of buildup continues.

Now, this is an extremely disturbing element, which I think is at the heart of the civil defense debate in this country in terms of the amounts of money we ought to be spending in comparability.

Can you go any further beyond, in terms of motivation or will or momentum, to explain why such civil defense planning has occurred, in light of your comments regarding its ineffectiveness for them, and the July CIA study, which concurred that it really would not protect them very much at all. Why do they persist in doing this if in fact we have decided that it really will not be very helpful to them and, as you have suggested, it could indeed be destabilizing if they were very successful at it?

Mr. WARNKE. I'm afraid, Senator Lugar, that I've been very unsuccessful at trying to analyze Soviet motivations. I have spent the better part of the last 2 years trying to do it, and I have not been satisfied with my speculations. I think we have to recognize, though, that to some extent their strategic thinking has always lagged behind us.

Now, there was a time back in the early 1960's when we were supporting the idea of a much, much more comprehensive civil defense program, and we finally concluded that this was a waste of time and a waste of money. Now, I don't have any satisfactory answer for the Soviet military buildup. It is clear that they are spending a much

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higher percentage of their gross national product than we are, I would say in excess of twice as much. Of course, as the chairman has pointed out, their gross national product is about half of ours, so that the net result isn't perhaps as impressive as that one percentage figure itself might indicate.

But they have been engaged in a very substantial buildup of conventional forces in central Europe. They have been engaged in modernizing and adding to their strategic nuclear forces. And you have to be concerned about that phenomenon, and I think we are. So really, the question that I think we have to decide is whether a substantial increase in the amount of money we devote to civil defense is a necessary part of the effort to match, to counter, to neutralize Soviet military expenditures.

I have an opinion on that. My opinion is that, as Secretary Brown said, I believe, back a couple of years ago, the way to counter a relatively ineffective system is not to replicate it on the other side. I don't think we ought to let the Soviet Union form a model for us as to what a prudent expenditure of defense money is. I haven't found them a terribly attractive model in other respects.

They have wasted an awful lot of money on an agricultural system which is singularly ineffective. And I think we've got to decide this not on the question of whether we ought to match what the Soviet Union is doing across the board, but our own best judgment as to what the level of expenditure ought to be and how it ought to be allocated.

Senator LUGAR. Let me pursue this in a different way. In the event that the logic you have presented is true and that a civil defense system would not be effective on either side, and you suggest there is no need for us to throw good money after bad, is it not the case, too, that, having read that this type of defense is inadequate, that in the event of nuclear strike that we would be paralyzed, or that the governmental systems might simply not function? In other words, in the event that nuclear war comes, since we have not prepared for it on the basis that it would have been a waste of money really to do so, except in a few marginal humanitarian causes—some people, it seems to me, even move beyond this to take a rather blase feeling with regard to the Soviet buildup and the possibilities for war, a come-what-may feeling about the thing. Isn't there something to be said about this? I think Senator Schmitt has alluded to it in his earlier statement, about simply engendering some will to survive, some will to cope with circumstances?

There may be even blackouts in New York presently, quite apart from a nuclear attack or various problems around the country, which we will need to cope with. But it seems to me that we may be drifting into a problem caused simply by a lack of our own mental rigor and not necessarily a strategic problem.

How does the civil defense issue fit into a commonsense organizational principle on the part of communities, States, and the Nation in order to promote willpower which will enable us to cope, to survive, and to take a look at the horrors and the difficulties? In other words, we are suggesting in this hearing, apparently, that not a whole lot can be done to save lives, but maybe that's not true. Maybe in fact, proceeding with some ingenuity, a good bit could occur.

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What do you have to say about the problem of engendering will? And secondly, is it not the case that if we worked harder at civil defense, we might be more effective and the percentage of probable survivors might increase substantially?

Mr. WARNKE. Well, again, Senator Lugar, I would separate out two issues, because I think they are separate issues. One of them is the one I have been addressing, which is whether we have to go ahead with a considerably increased civil defense effort in order to preserve the strategic balance that deters nuclear war. And my answer to that question is, no; we don't, because it does not play a significant part in the overall strategic balance.

Now, I think what is important for us to do is to continue to see to it that we do those things that preserve our retaliatory capability, that makes nuclear war not an acceptable option for the other side. And we are doing that. We are going ahead with those programs that will insure that we will have survivable retaliatory forces. I think that is important. I think it is the most important, because to me the most important thing is to see to it that nuclear war does not happen.

But then there is a second issue, and that is whether it is desirable to have some greater program to take care of the situation to the extent that you can in the event that deterrence fails. A separate question from the strategic balance, but, I would agree with you, an important question. And it is for that reason that I support the idea of the new Federal Emergency Management Agency, to see to it that we do a better job of determining whether there are some things that might to some degree mitigate the devastation that would occur in the event of a nuclear war; and also to cope with other aspects of civil defense that are separate from the strategic nuclear exchange.

I agree with that. I think it is important. But I submit that the two issues ought to be considered separately.

The CHAIRMAN. Senator Schmitt?

Senator SCHMITT. Mr. Warnke, do you think that there are policy options that the Soviets consider exercising that we not only do not, but would not under any circumstances, with respect to strategic matters?

Mr. WARNKE. I believe that it would be prudent, Senator Schmitt, to assume that that is the fact; yes.

Senator SCHMITT. Don't you think that there is a considerable amount of evidence to that effect, particularly in terms of intimidation and brinksmanship?

Mr. WARNKE. There's no question of the fact that, as between the two superpowers, we are a benignant force and they are not.

Senator SCHMITT. But don't you believe that in that may lie some of the explanation, if not most of the explanation, of Soviet expenditures, both for weapons systems and for civil defense, to provide them the pressure, if you will, to get away with intimidation and brinksmanship without ever actually causing a confrontation and therefore realize their foreign policy aims?

Mr. WARNKE. Again, that would be a prudent assumption to make. But I submit that that doesn't decide the question as to whether we ought to increase our civil defense expenditures.

Senator SCHMITT. I'm not implying it should on that issue. But I think we have forgotten about other Soviet manifestations of foreign

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policy. It is very clear in the world today that there is this continued pressure in other sectors of the world, that is backed up by that strategic capability that they continue to pursue. Today, we have not really talked about that, and I think it is important to realize that they have other foreign policy aims besides being able to survive a nuclear exchange.

Mr. WARNKE. I think that is correct.

Senator SCHMITT. Do you think that they believe, sincerely believe, that they cannot prevent a retaliation on our part?

Mr. WARNKE. Yes, Senator Schmitt, I do believe that. I think any rational human being has to recognize that we have the retaliatory capability that would devastate them.

Senator SCHMITT. Do you think their research and development test efforts are geared to trying to, at some point in the future, prevent a retaliatory strike by our forces?

Mr. WARNKE. I would assume that R. & D. is being conducted for that purpose. I believe that is the case for us, too.

Senator SCHMITT. And if one was designing with that thought in mind, the Soviet mindset, as the expression goes now, would not a civil defense capability go along with that? Would not it be designed to clean up whatever retaliation did maybe get through either defensive systems or the effects of a first strike which was not responded to before that strike hit?

Mr. WARNKE. I believe, Senator Schmitt, that both we and the Soviet Union would like to have meaningful strategic superiority, and if you could have an effective civil defense program that would spare you unacceptable damage, that would be part of strategic superiority. I don't believe that it is possible at the present time.

Senator SCHMITT. Well, it may not be possible at the present time, but if their general weapons philosophy is to try to build a first strike capability and one that prevents significant retaliation, then, in parallel to that, a civil defense program makes very good sense, does it not?

Mr. WARNKE. It would if you were able in fact to prevent the other side from having an effective retaliatory capability.

Senator SCHMITT. That's right, but if they set that as their goal, whether they can do it or not, it would make eminent good sense to carry on a secondary program of civil defense so that they can in fact protect themselves against whatever retaliation, minor retaliation, gets through, assuming they have achieved their goal of preventing significant retaliation.

Mr. WARNKE. That would be the case and that is why I suggested in my opening remarks that perhaps we ought to wonder why their civil defense effort is so small. I mean, they certainly have not exploited the possibilities.

Senator SCHMITT. Do you think our verification systems are adequate to know exactly what their civil defense effort is?

Mr. WARNKE. To know adequately what their civil defense effort is, yes. Certainly we would know if they were conducting any evacuation drills. It is hard for me to see how you would have any confidence in an evacuation program if you never even tested it.

Senator SCHMITT. What do you think our response would be to a major evacuation drill carried out by the Soviet Union?

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Mr. WARNKE. I don't think I would want to speculate about that, Senator Schmitt. At a time of intense crisis, I think it would be foolhardy for them.

Senator SCHMITT. But do you think we would really launch a preemptive strike on the basis of an evacuation drill? I'm not sure that our people have that kind of mind-set.

Mr. WARNKE. I think it would depend upon the intensity of the crisis. Certainly if we were to conclude that there was a substantial chance of them striking first, I'm sure that this possibility would cross the minds of our planners, and I think the Soviet Union would have to assume that that would be the case.

Senator SCHMITT. I'm not sure. That is an interesting discussion.

Mr. WARNKE. I'm not sure either, Senator Schmitt, but I think they would not be sure either. They certainly would not be sure we wouldn't.

Senator SCHMITT. Following up on some of Senator Lugar's thoughts and expanding slightly, we talked this morning about civil defense as a mechanism for saving lives, which is certainly a fundamental purpose, and without saving lives other things become moot. But really, in the process of saving lives, we also would be attempting, I would hope, and would keep in mind the savings of institutions, of an ideology, if you will, that has nestled on our shores now for the better part of 2 or 3 centuries.

Do you think that that is an equally important factor to the saving of lives, the saving of the institutions of freedom?

Mr. WARNKE. I certainly do, Senator Schmitt. I don't believe that any one of us would want to survive in a world in which our institutions had been eroded.

Senator SCHMITT. If the Soviet Union believed equally strongly in their ideology, would that not be a factor in their thinking also?

Mr. WARNKE. It could be. But that is a separate issue from whether or not matching the Soviet civil defense effort is necessary to preserve the strategic balance.

Senator SCHMITT. Again, in determining whether we should match it or even increase our own effort, we need to understand what may be their motivations, and one of their motivations may be to preserve an ideology. And if you take a very long view of history, as the Soviets have done at times, then that could again add to their motivation of a civil defense system. Even though they might take extreme losses, if their capability in the event of an accident, theirs or ours, to survive as an institution, through a civil defense system, might well be a major motivation on their part.

Mr. WARNKE. That certainly is a possibility.

Senator SCHMITT. It might also be a good motivation for us to consider, if we are in fact going to increase our civil defense capabilities.

Finally, Mr. Warnke, you know there are a few situations on this Earth and even in this country where hundreds of thousands of people are immediately threatened in terms of life and property. The most obvious, of course, is southern California. Again, following up on Senator Lugar's remarks, do you not think that the secondary, which may in fact be the more likely, benefits of a strong civil defense program, particularly evacuation preparedness, would justify increasing civil defense spending in this country?

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Mr. WARNKE. It might very well, Senator Schmitt, and that is why I indicated in my opening remarks that from the standpoint of getting both some insurance against a failure of deterrence in order to mitigate the loss of lives, in order to increase the prospects of survival of our Government or our institutions, and certainly from the standpoint also of dealing with civil disasters, we might very well decide that it was useful to increase the amount of money that we spend on civil defense.

But again, I submit that that is a separate question from whether it is necessary to do that in order to preserve the strategic balance.

Senator SCHMITT. Well, I'm not sure they're entirely separate questions. I think one can evaluate the advantages and disadvantages of doing one in the context of the other. Some of us in the Commerce Committee have discussed the situation in southern California where the probability of a major earthquake within our lifetime is very high, and I mean a major earthquake. And we have done practically nothing as a Federal Government, and very little in terms of the State level, to prepare ourselves for that eventuality. And one of the reasons is, we don't know what to do with the information if we were able to predict it. What are you going to do, particularly in this country, if you predict wrong and everybody leaves and nothing happens? Then what do you do the next time, when you really have it?

The Chinese solved that problem by their form of government. But I'm not sure what we would do. But it doesn't mean we shouldn't be trying to do something.

Mr. WARNKE. I certainly have no disagreement with that, Senator Schmitt.

The CHAIRMAN. I have just a few other questions, Mr. Warnke.

Has civil defense been discussed in the SALT negotiations and, if so, what has the Soviet position been?

Mr. WARNKE. It has come up, Senator Proxmire, in connection with the joint statement of principles and guidelines for SALT III. Now, we felt that it is useful to broaden the agenda in SALT and to get into such questions as civil defense and air defense. And as a consequence, this has been raised, not as a SALT II issue, but as a prospective issue for SALT III.

The CHAIRMAN. It has been suggested that we proceed with the development of certain weapons systems as a bargaining chip for subsequent negotiations. Would it be conceivable that we could proceed with the development of a civil defense system as a bargaining chip? We give up ours and they give up theirs?

Mr. WARNKE. I really, Senator Proxmire, have never been an advocate of the bargaining chip theory. I think that spending money on things so you can later give them away is an imprudent expenditure of funds. What gives us our bargaining leverage is our ability to do things, not going ahead with expenditures that are not necessary from our own standpoint in order to improve our defenses.

I don't think, also, that the Soviet Union would regard a civil defense program on the part of the United States as being a matter of grave concern. In response to your earlier questions, I said that I did not feel that an increase in our civil defense program would be

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provocative or would be destabilizing. I think it ought to be viewed on other grounds and terms.

The CHAIRMAN. Now, you say that even the successful—and I'm quoting you now—"the successful evacuation of 80 percent of the urban population could be offset by a simple adjustment of targeting patterns to maximize fatalities." Can you describe in general terms how this could be done?

Mr. WARNKE. Well, it can be done, of course, by changing the targets, and also utilizing ground bursts. If you want to kill more Soviets in a strategic exchange, then by having lower-level explosions you can maximize the number of fatalities. And the studies indicate that, even if Soviet evacuation and sheltering plans were to be carried out and were to be carried out successfully, you could increase the number of fatalities up again so something like the 85 million level by that type of targeting and by that type of ground bursts.

The CHAIRMAN. Well, let's make the assumption, disregarding the humane element here, and that would certainly be a consideration, that the purpose of the nuclear exchange is to try to destroy the enemy's capability. Under those circumstances, wouldn't an evacuation be likely to save millions of lives and wouldn't it be unlikely that the other side would respond by changing their strategy to kill another 20 or 30 or 40 million people? Wouldn't they continue to concentrate on trying to destroy industrial and military targets?

Mr. WARNKE. Well, Senator, I would like to address that from two standpoints, one of them the humanitarian standpoint. Certainly, consistent with our overall ideology and our overall principles, we would not want to maximize the number of fatalities on the other side.

The CHAIRMAN. Well, there's no reason why they should, disregarding the humane element for the moment. They want to destroy our military capability.

Mr. WARNKE. If you really wanted to put yourself at the maximum advantage, assuming that anything could exist after a strategic nuclear exchange, perhaps the best way to do that, and to combine that along with some measure of morality, would be to destroy the infrastructure, and as a consequence make that population a burden rather than an advantage; do the maximum damage to the industrial facilities, to the transportation system, and everything else, and turn them from a modern society into an India.

The CHAIRMAN. Let me just follow up very briefly the question that Senator Schmitt asked. Does the United States need a civil defense effort for defense against not strictly a Russian attack, but an attack by a third country, a terrorist attack, or an accident?

Mr. WARNKE. I think that a civil defense program would be justified to deal with that. I mentioned the analogy, Mr. Chairman, of our ABM rationalization. We recognized we could not defend against a heavy Soviet attack, but that an ABM system, if deployed on a nationwide basis, might protect against accidental launch or the predictable Chinese threat.

Now, I would suppose that if we are unsuccessful in our nonproliferation policies, so that nuclear weapons do fall into the hands of third countries or perhaps even subnational groups, this would be a further reason for a civil defense program.

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The CHAIRMAN. Now, in your statement you indicate that some modest program aimed at evacuation techniques may be justified in case deterrence fails. What would you include in such a modest program?

Mr. WARNKE. I'm not sure that I know, Senator Proxmire. I think that we would have to do much more than we have done in the way of studying as to what sort of civil defense program might be justified for that purpose. I don't think that we ought to rely just on the Soviet model as being necessarily the best model.

The CHAIRMAN. Would you feel that our present program of about $97 million a year and no apparent evacuation program was adequate?

Mr. WARNKE. I don't really think that we are getting our money's worth at the present time, Senator Proxmire, no, and that is why I support the idea of a Federal Emergency Management Agency that would in fact study these problems and see if we can't end up with a more effective program, which I would assume would cost us somewhat more, but it might be money that is much better spent.

The CHAIRMAN. Do you believe that a civil defense program designed to enhance survivability would reassure our allies of the continuing meaningfulness of the nuclear coupling, or would it convince the Soviets of the seriousness of our commitment?

Mr. WARNKE. I doubt that it would have any significant impact in that regard. I think that what reassures our allies is the fact that we maintain the strategic balance and maintain our retaliatory capability.

The CHAIRMAN. Senator Lugar?

Senator LUGAR. I have just one further question. What would be your advice with regard to a civil defense program in the event the SALT Treaty should not be ratified this year? At what point should we proceed in a different direction, or in fact should we at that point?

Mr. WARNKE. I think that really civil defense would be academic then in terms of the strategic balance. I would say if SALT failed, that we ought to put our maximum amount of money then into building up our strategic offensive forces. I think we would have to spend something like an additional $5 to $6 billion a year, and I would hate to see that diluted by spending more of it on a civil defense program that would become increasingly academic.

The CHAIRMAN. For the record, would you provide what you mean by $5 or $6 billion a year? That is quite a shocker. I would like to know how you arrived at that.

Mr. WARNKE. I would be happy to, Mr. Chairman.

[The information follows:]

Without SALT, Soviet strategic nuclear delivery vehicles (ICBM launchers, submarine missile tubes and heavy bombers) will increase from about 2,550 to 3,000 by the end of 1985. Our total is about 2,050. The new SALT ceiling is 2,250 each.

We would thus be faced with a potential 3 to 2 Soviet advantage and would have to increase our own total by almost 50 percent.

The additional systems would be very costly. The B–1 program of 244 was estimated at around $40 billion. An MX ICBM deployed in multiple vertical shelters, or a new large aircraft, could run to an additional $30 to $50 billion.

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Therefore if the deficit of over 900 strategic nuclear delivery vehicles were to be made up, an additional $5 to $6 billion annually for strategic arms between now and the end of 1985 is a very conservative estimate.

The CHAIRMAN. Senator Schmitt?

Senator SCHMITT. Mr. Warnke, I have only one more question and I will get to it indirectly in my subquestions.

It is my feeling—and I believe it is yours—that the Soviets' standing army, if you will, the military armed forces, represent a strategic factor, particularly with respect to Europe. I'm sure China feels much the same way. Would you agree with that?

Mr. WARNKE. I would agree with that, Senator Schmitt.

You have all kinds of definitions as to what is "strategic" and what is "tactical." I would certainly say that the size of the Soviet standing army makes it a strategic factor.

Senator SCHMITT. We do not really attempt to counter that in terms of size. We have, hopefully, a good volunteer force and one which, if we act properly in this Congress, will be better equipped in the not-too-distance future; but we have excellent systems in development and tests.

Now the reason I bring this up in a civil defense context is that the traditional reliance of this Nation is on its citizen soldier, the National Guard and Reserve Forces. Do you see that there is a relationship between the improvement of our citizen soldier's capability and our ability to provide for civil defense activities, particularly in those nonstrategic exchange areas?

Mr. WARNKE. Yes; I can see a relationship, Senator Schmitt.

Senator SCHMITT. Would you support the significant improvement of the National Guard and Reserve Forces in terms of the equipment available to them and the training available and the benefits for serving in those forces?

Mr. WARNKE. I certainly feel that a number of improvements are not only possible but are badly overdue.

Senator SCHMITT. And do you think that, in that improvement, a diminution of civil defense would be a useful function for those forces?

Mr. WARNKE. It could very well fit in within their overall mission, yes, sir.

The CHAIRMAN. Well, thank you very, very much, Mr. Warnke. You have been an excellent witness, most helpful and responsive, and once again I reiterate: You have served this country nobly and we are mighty grateful to you for it.

Mr. WARNKE. You are very kind, Mr. Chairman. Thank you.

The CHAIRMAN. The next witness is Dr. Samuel Huntington who is the Director of the Center for International Affairs at Harvard University. He was the Coordinator of Security Planning for the National Security Council during the Presidential Review Memorandum 32 study. Dr. Huntington has views that are considerably at variance with Mr. Warnke's, and we are very happy to have Dr. Huntington before us.

Dr. Huntington, you have a detailed statement and we would appreciate it if you could abbreviate the statement. We have had an opportunity to see it—so we can get into questions as soon as possible.

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STATEMENT OF SAMUEL P. HUNTINGTON, CONSULTANT TO NATIONAL SECURITY COUNCIL; DIRECTOR, CENTER FOR INTERNATIONAL AFFAIRS, HARVARD UNIVERSITY; PROFESSOR OF GOVERNMENT, HARVARD; FORMERLY COORDINATOR OF SECURITY PLANNING FOR NATIONAL SECURITY COUNCIL

Dr. HUNTINGTON. Thank you very much, Mr. Chairman.

I am delighted to have the opportunity to testify before you and your colleagues here today.

What I would like to do is very briefly to summarize my statement, and then add a few additional remarks.

U.S. civil defense policy in the 1980's must be rooted in a realistic understanding of the strategic environment which will confront the United States in that decade.

As a starting point, it is, I think, safe to assume that that environment will be characterized by a continued mixed relationship between the United States and the Soviet Union.

Senator SCHMITT. Dr. Huntington, could you bring your microphone just a little bit closer?

Dr. HUNTINGTON. I'm not on the same high level as Mr. Warnke.

[Laughter.]

Dr. HUNTINGTON. As a starting point, I think it is safe to assume that that environment will be characterized by a continued mixed relationship between the United States and the Soviet Union, involving some areas of limited cooperation and other areas of intense competition.

During this period, the Soviet Union will in all probability continue its efforts to extend its global political and military reach both directly and through its satellites. At some point, these efforts could pose significant threats to the vital interests of the United States and our allies, including threats to our supplies of oil and other natural resources. In such cases, the possibility of conventional military conflict between American and Soviet military forces would be very real and would carry with it the possibility of escalation.

These possibilities of conventional conflict will exist in an environment in which the overall military balance of power will be significantly different from that of the 1960's. Essential equivalence in strategic forces now exists between the two superpowers. Within this context, however, during the next 5 years two significant asymmetries will favor the Soviet Union.

First, the Soviet Union will have the capability to destroy a substantial portion of our ICBM forces in a first strike.

Second, they will have a substantial civil defense program, the dimensions of which are very carefully spelled out in the document released by the Director of Central Intelligence last summer, and which program could—through a combination of shelters and evacuation—provide protection for Soviet leadership and the bulk of the Soviet population in the event of a nuclear crisis.

In such a crisis, these two asymmetries could conceivably reinforce each other, creating a situation in which the U.S. ICBM force would be vulnerable to a Soviet first strike, Soviet leadership and population could be substantially protected against an American second strike,

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and U.S. leadership and population would be highly vulnerable to a Soviet third strike.

The extent of the vulnerability of U.S. society now, which is summarized in table 1 on page 6 of my written statement, is a development of the past decade.

In the 1960's, the U.S. possessed significant offensive damage-limiting capabilities that could have blunted a Soviet strike aimed at our cities. That is no longer the case. We have no active defenses against missiles, and very little against airplanes. Our ability to control escalation is uncertain, and dependent upon such control also serving Soviet interests. Hence, in the 1980's, civil defense assumes new significance as one possible way of enhancing the survivability of American leadership and population.

How effective Soviet civil defense would be in a nuclear confrontation is a matter of debate. What is not debatable is the importance the Soviets attribute to civil defense, spending on it a portion of the total defense budget and of their strategic budget some 10 times that which the United States does.

For them, it is an inherent part of their defense posture. This is well reflected in the fact that, when they achieved nuclear parity with the United States at the end of the 1960's, they did not then limit or cut back on their civil defense as would have been required by the logic of mutual deterrence and mutually assured destruction.

Instead, they intensified their civil defense effort. This behavior cannot, I think, be explained by the relatively primitive Chinese nuclear capability which is highly vulnerable to Soviet offensive action.

The explanation, instead, has to stem from the entire Soviet approach to deterrence. In Soviet doctrine, "effective deterrence" has to involve not only the ability to inflict damage on the enemy, but also the ability to limit damage to oneself.

This is the strategy they have followed in three ways: by developing an incredibly large and complex air defense system designed to stop our aging B–52's; by introducing their modern, large missiles which can do substantial damage to our ICBM force; and by speeding up their civil defense program which can, in some measure, protect their leadership and population against retaliation by our SLBM forces.

They thus have acted to limit damage they might suffer from each leg of our triad. In this context, the expansion of their civil defense program in the 1970's makes very good sense.

While we talk about a strategy of mutually assured destruction, they are clearly following a very different strategy of offensive and defense damage limitation designed to insure, so far as is possible, that the destruction is not mutual.

In this environment, an expanded and upgraded U.S. civil defense program focused largely on urban evacuation and population dispersal can play three important roles:

First, it can contribute to deterrence. Given the emphasis that the Soviets place on damage limitation, they cannot assign a high credibility to a U.S. deterrence policy that does not attempt to limit the damage that will be done to the United States if that deterrent threat

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has to be implemented. A threat to commit suicide simply is not credible to them. This would be particularly true with respect to Western Europe. The more vulnerable American society is to the Soviets, the less the credibility of the U.S. nuclear deterrent to the Soviet political and military action against Western Europe.

This is not to say that this U.S. disadvantage would lead the Soviets to risk lightly a nuclear war; I think they would proceed very cautiously. It is rather to say that their risks of nuclear war would in fact be less, and would be perceived to be less, in the situation in which the vulnerability of American society significantly exceeded their own.

Indeed, in an era of strategic parity, an improved U.S. civil defense posture is almost an essential corollary and ingredient of our NATO strategy of flexible response.

Second, a civil defense program can help to maintain stability, provide additional options, and furnish additional time for negotiation during a major crisis. It could significantly reduce the possibility of the Soviet Union attempting to coerce the United States.

In the absence of a population relocation capability, if the Soviets began to evacuate their cities in a crisis, the United States would be confronted with the alternatives of either launching an attack while the evacuation was in process thereby initiating nuclear war and insuring massive retaliation on the vulnerable U.S. population; or allowing ourselves to be placed in a bargaining position in which our more vulnerable population could be held hostage by Soviet weapons.

As I heard one of our leading defense officials once remark, it would well be worth spending perhaps $100 million a year simply to insure that no President will ever have to choose between those two grim options.

Third and most basic, of course, a civil defense program can contribute to the survivability of leadership and population. Only by doing this, and by being perceived as doing this, can civil defense also contribute to deterrence and crisis stability.

The overall goal of our foreign policy is of course to prevent nuclear war, but no one can guarantee the success of that policy for the remainder of this century. And one does not have to assume Soviet—or American—recklessness or utter maliciousness. All one has to do is admit the possibility that some combination of miscalculation, communications failure, inability to understand the other side's motives, a little political shortsightedness and some bad luck, could provide a pattern of action and reaction from which neither side could escape and which could bring disastrous consequences neither side wants.

The danger of catastrophe arising from the unpredictability and uncertainty and uncontrollability of events has led governments of many other countries to make major investments in civil defense against the possible dangers confronting their society. In many cases, their expenditures on a per capita basis far exceed ours. And I do not think that anyone can be sure enough of the future to say that those expenditures are not a prudent investment; or that we can say that we have some special immunity.

The core of an expended civil defense program should be, in my view, a program for population dispersal. Given the devastation

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created by nuclear war, such a program would never make recourse to nuclear war an attractive policy option. It could, however, very possibly save tens of millions of lives, a saving which could be reduced but not eliminated in the unlikely event the Soviets targeted the evacuated population.

Studies indicate that, in the event of a counterforce, countervalue exchange between the United States and the Soviet Union in the mid-1980's, a population evacuation and dispersal program could mean the saving of 55 million lives, or roughly one-quarter of the U.S. population.

The achievement of this capability by the late 1980's would require the expenditure of something like $220 million a year for the next 7 years, a relatively modest insurance premium of roughly $1 per person per year.

It was, Mr. Chairman, I believe these considerations that provided the basis for the President's policy determination in PD–41 and for the decision to upgrade our evacuation capacity during the coming years.

Those decisions have come in for a certain amount of criticism in the past couple of months in the press and elsewhere. And in closing, I would just like to deal—if I may, Mr. Chairman—with some of the points that the critics have made.

First, some critics allege that city evacuation is impossible. That, clearly, however is not the case. Rapid city evacuations have occurred in the past, and as Mr. Tirana points out in his statement: A million and a half people were evacuated out of London in 2 or 3 days at the beginning of World War II. In addition, over 10 million Americans left the cities during the week of the Cuban missile crisis. That was a spontaneous evacuation. With our large number of automobiles and highly developed road system, we are perhaps better equipped to evacuate cities than almost any other country on earth.

Second, some critics allege that evacuation will be ineffective; that the evacuees will suffer inadequate food, water, sanitary facilities; that they will be vulnerable to long-term fallout and the effects of the possible depletion of the ozone layer.

The answer to this clearly is: That the inadequacies of and sufferings from evacuation will be minimized to the extent that there is advance planning and preparation. And certainly no one suggests that evacuation will be a picnic. But what is the alternative? If the choice is between inadequate sanitary facilities in a rural high school and incineration in the central city, there is not much doubt which most people will choose.

And in order to deal with the longer term consequences of nuclear war, we obviously also have to surmount the immediate consequences. The argument that we shouldn't seriously consider evacuating our cities because we do not know how to deal with a possible—and I might say, highly conjectural—depletion of the ozone layer sounds to me somewhat like an argument that we should never have developed the public health measures to prevent Americans from dying of smallpox and tuberculosis at age 40 because they now die of cancer and heart attack at age 70.

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Third, the critics make the argument that the devastation in a nuclear war will be so extreme, the absolute levels will be so high, that evacuation even if it did work wouldn't make much difference.

The critics reel off overwhelming and appalling statistics on the various dimensions of the devastation which will follow an all-out nuclear exchange.

All of this is horrifying and makes a very convincing argument; but it makes a very convincing argument not against civil defense, but against nuclear war.

Clearly, the prevention of nuclear war has to be our No. 1 priority, but if that policy should fail the evidence also suggests that prudent civil defense measures could ameliorate the consequences of nuclear war.

The horrifying figures which are cited are, to my mind, a powerful argument both against nuclear war and in favor of an effective civil defense.

In addition, these figures totally ignore the high probability that a nuclear exchange between the United States and the Soviet Union could be a limited one in which devastation would be restricted and in which consequently the benefits from a carefully worked out civil defense program would be proportionately greater.

Fourth, some critics have argued that evacuation of our cities would be provocative.

In some highly specialized circumstances, an order to evacuate cities might have a provocative consequence. But it is almost impossible, I believe, to imagine an American President ordering an evacuation except when it was an unavoidable response to Soviet provocation. Evacuation of American cities is most likely to occur only after the Soviets order evacuation of their cities. In addition, what we are considering now is a program which would make evacuation a possible option, not a necessary choice. Unless the critics are willing to argue that evacuation is provocative under all circumstances no matter what the Soviets do, then the case stands for having that capability and being able to utilize it if it should be necessary.

Fifth and finally, some critics say that possession of an evacuation capability could increase the willingness of our leaders to permit nuclear war and could lead them to believe that a strategy oriented toward the fighting of nuclear war is a desirable strategy.

Here, however, all the evidence available and presented by the critics demonstrates conclusively that in an all-out nuclear war, the American society as we know it would be substantially destroyed.

Some Americans, however, will survive and an evacuation program could insure the survival of millions more. The suggestion that, because an evacuation program could reduce American fatalities from 100 million to a mere 50 million, that therefore those of us who favor such a program view with light-hearted eagerness the possibility of nuclear war, that suggestion would be in my view totally scurrilous if it weren't so totally ridiculous.

No one can guarantee, Mr. Chairman, with any certainty that a program of urban evacuation would, in the event of catastrophe, save 50 or 60 million lives; but no one, also, can guarantee that we will not have a nuclear confrontation during the remaining years of this

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century. And unless one can guarantee the latter, it makes good sense to have the capability to undertake the former.

Nuclear war is, in many respects, unthinkable; but that does not mean that it is impossible. And so long as that possibility exists, simple prudence dictates that we take out insurance against it in the form of a modest program which could in a small way reduce the probability of catastrophe and which, if catastrophe did occur, could save the lives of tens of millions of Americans.

[Complete statement of Dr. Huntington follows:]

TESTIMONY OF SAMUEL P. HUNTINGTON, DIRECTOR, CENTER FOR INTERNATIONAL AFFAIRS, HARVARD UNIVERSITY

*Civil defense for the 1980's**

I. INTRODUCTION

The United States now has and has had since the mid-1960s only a skeleton civil defense program. Changes in the international environment and in the military balance of power during the last decade now make it most desirable for the United States to develop a more effective civil defense program for the 1980s. Such a program should include improved provisions to insure the protection of national leadership and the continuity of government. It should also provide for further study of the possible ways of protecting industrial facilities and of the desirability of requiring, as many European governments do, the inclusion of shelters in new residential and business construction. The central element in such a program, however, should be planning and preparations for the evacuation of major cities and the dispersal of population in the event of crisis. It is this general need on which I will focus in these remarks.

The evacuation of cities could be warranted by natural disasters, nuclear accidents, or terrorist threats. In this statement, I will, however, be concerned with evacuation and dispersal only in the context of: (a) a nuclear crisis involving the United States and the Soviet Union, in which one or both sides changes the status of its nuclear forces in a manner threatening to the other; (b) a limited nuclear exchange between the United States and the Soviet Union; and (c) an all-out nuclear war between these two countries.

II. THE STRATEGIC ENVIRONMENT OF THE 1980'S

The strategic environment of the 1980's will be characterized by a continued mixed relationship between the United States and the Soviet Union, involving some areas of limited cooperation and other areas of intense competition. During this period, the Soviet Union will, in all probability, continue its efforts to extend its political and military global reach both directly and through the actions of its satellites. The past year has seen the major expansion of Soviet influence in Ethiopia, South Yemen, and Afghanistan, and the active involvement of Ethiopian, Vietnamese, and Cuban troops in wars with other peoples. Similar actions seem likely in the future. In some instances, such activities could pose significant threats to the vital interests of the United States and its allies, including threats to our supplies of oil and other natural resources. In these circumstances, the possibility of U.S. military involvement with the Soviet or satellite forces would be very real, and such conventional conflict always carries with it, of course, the danger of escalation.

The past decade has also seen a significant change in the military balance of power between the Soviet Union, on the one hand, and the United States and its allies, on the other. The Soviet Union has now achieved essential equivalence in strategic forces with the United States. During the next several years, moreover, the Soviet Union will have significant advantages vis-a-vis the United States in two key sectors of the overall strategic balance. First, the Soviets will have the capability to destroy a major portion of the U.S. ICBM force in a first strike, while the United States will not have a comparable capability vis-a-vis the Soviet Union. Second, the Soviet Union will have a substantial civil defense program

*The views expressed in this statement are purely personal ones and not necessarily those of any U.S. Government agency.

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which could, through a combination of shelters and evacuation, provide protection for Soviet leadership and the overwhelming majority of Soviet citizens in the event of a nuclear confrontation. The United States will not have a comparable capability. These two imbalances in the strategic equation interact with and reinforce one another. An American President would not be in an enviable bargaining position in a crisis if his ICBM force was vulnerable to a Soviet first-strike, if Soviet leadership and population were substantially protected against a U.S. second strike, and if U.S. leadership and population were highly vulnerable to a Soviet third strike.

The change in the balance of strategic offensive forces has significantly increased the damage which the United States would suffer in the event of a nuclear exchange with the Soviet Union. In a nuclear conflict, damage can be limited and survivability enhanced through four possible means: (a) offensive damage limitation; (b) escalation control; (c) active defenses; and (d) civil defense. Down through the 1960's, the United States possessed significant offensive damage-limiting capability. With the growth of Soviet strategic forces, this capability was greatly degraded, and the United States cannot now, by either a preemptive or a retaliatory attack, significantly limit the damage that Soviet strategic forces could inflict on American society. In part as a result of this development, the last Administration and the current one have placed increasing emphasis upon the importance of controlling escalation once a nuclear exchange begins. At the same time, however, the rate at which escalation could occur has become at least as dependent on Soviet decisions as on American ones. The decision on nuclear escalation no longer rests primarily in American hands, as it did a decade or so ago. In addition, the ABM treaty in effect bans active defenses against missile attacks, and the United States has chosen not to maintain either a significant continental air defense capability or a meaningful civil defense program.

As a result, the damage which the United States would suffer in a nuclear exchange is much greater now than it was in the past. If an all-out nuclear exchange were to occur now, the bulk of U.S. industry and urban structures would be destroyed and a high proportion of U.S. leadership and probably over 100,000,000 citizens would be immediate fatalities. In the absence of countermeasures, this vulnerability will increase in the future. Given the ABM treaty, the uncertainties concerning escalation control, and the difficulties—and destabilizing disadvantages—of developing a significant offensive damage-liability capability, civil defense clearly assumes new importance as a means of enhancing the survivability of American citizens.

The existing situation with respect to the United States stands in rather dramatic contrast to that of the Soviet Union (see Table 1). The Soviets have had a sizeable civil defense program dating back to World War II and even earlier. Its current dimensions are well outlined in the public version of the intelligence study of this subject released by the Director of Central Intelligence last July. I will not attempt to repeat its findings here. It should be pointed out, however, that the Soviet program is a major effort, involving shelter construction as well as evacuation planning, employing over 100,000 full-time workers (as compared to less than 6,000 in the United States), and involving costs equal to perhaps one percent of the Soviet defense budget (as compared to the U.S. civil defense program costs of about one-tenth of 1 percent of the defense budget). The Intelligence Community study estimates that the Soviet program would provide over 15,000 hardened or blast-resistant shelters for 110,000 leaders, 12 percent to 24 percent of the total work force, and 10 percent to 20 percent of the total urban population. Given warning time of three to seven days, the remaining urban population which could not be accommodated in shelters could be evacuated to rural areas and small towns and villages.

TABLE 1.—EXPECTED RESULTS FROM MASSIVE UNITED STATES-U.S.S.R. NUCLEAR EXCHANGE, 1979, ASSUMING IMPLEMENTATION OF CIVIL DEFENSE MEASURES ON EACH SIDE

	United States	Soviet Union
Population survival:		
Initial survivors (percent)	35 to 65	80 to 90.
Immediate fatalities (millions)	72 to 137	23 to 50.
Leadership survival:		
Personnel uninjured	Low	High.
Facilities undamaged	Very low	High.
Economic survival: Productive facilities undamaged	Low	Low.

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How effective this Soviet civil defense system would actually be in a time of crisis is, of course, a matter of intense debate. What is not debatable, however, is the continuing importance which the Soviets assign to civil defense. During the 1950s and the 1960s, U.S. nuclear capabilities far exceeded those of the Soviets and the Soviet Union had to consider nuclear attack highly probable in the event of any military conflict with the United States. During these years, consequently, Soviet emphasis on civil defense was highly understandable. Once the Soviets achieved nuclear parity with the U.S., however, the costs and risks of nuclear war to the U.S. clearly escalated, both societies became highly vulnerable to attack and, in keeping with the logic of mutual deterrence, the Soviet need for a large-scale civil defense program, particularly in the absence of a significant U.S. program, should have declined. Instead, at the very time that they achieved nuclear parity with the U.S., the Soviets also intensified their civil defense activities, reorganized and upgraded their program, appointed General Altunin to direct it and, since the early 1970s, have been carrying on their civil defense efforts at a considerably higher level than previously.

How can this be explained? It clearly runs directly counter to the doctrine of mutual assured destruction. It could, in part, be due to Soviet concerns about the Chinese but, given the disparity between Soviet and Chinese nuclear capabilities, a program of the size of their current one would hardly seem necessary to counter the still relatively limited Chinese nuclear threat. The principal explanation has to be found in Soviet military purposes and doctrine. In Soviet military thinking, the threat to commit suicide does not constitute meaningful deterrence. Effective deterrence has to involve not only the ability to inflict damage on the enemy, but also the ability to limit damage to oneself. Hence, if the Soviets are to exploit their new position of nuclear parity vis-a-vis the United States, they must also have the ability to protect their own society.

Between 1946 and 1973 according to a Brookings Institution study, the United States used nuclear forces some nineteen times as an instrument of its diplomacy; fourteen of these cases involved the Soviet Union. With the advent of strategic parity, U.S. use of its nuclear forces in this way has become less frequent. We still tend to think, however, of nuclear deterrence as our instrument: as something we do to prevent action against ourselves or our allies by the Soviet Union or other hostile countries. Our monopoly of this diplomatic gambit, however, is now gone. It is clear that Soviet leaders appreciate the political uses to which military force, including nuclear force, can be put: they have not missed the lessons of the Berlin crises, the Cuban missile crisis, and the October War. In terms of their own doctrine, however, in order to use their own nuclear forces effectively as a political instrument—something they could not do during the years of U.S. superiority, but something which they could do in years of parity or marginal Soviet superiority—they would have to be able to protect their own population. When viewed in these terms, that is, from the viewpoint of Soviet purposes and doctrine, the expansion of their civil defense program coincidental with their achievement of nuclear parity makes eminent good sense. In the 1950s and 1960s, the Soviets used civil defense to help compensate for their strategic inferiority. In the 1970s, an upgraded Soviet civil defense program reinforces the uses to which they can put strategic parity.

III. THE ROLE OF CIVIL DEFENSE IN U.S. POLICY

Civil defense programs can conceivably contribute to the achievement of four objectives: war-fighting, deterrence, crisis management, and survivability.

(1) *War-fighting.*—The enhancement of war-fighting capability is a major objective of Soviet civil defense. Their system is designed to sustain the flow of reinforcements and logistical support to the Soviet armies fighting in Europe while their homeland is under nuclear attack. The Soviets stress shelters, for instance, in order to keep a substantial portion of their work-force at or near their place of employment and thus to maintain economic activity for as long a period of time and at as high a level as conditions permit. War-fighting has not, on the other hand, been a significant objective of U.S. civil defense, apart from those FPA activities devoted to mobilization and the continuity of government. Nor would it be a major goal of a program oriented towards evacuation and dispersal of urban population.

(2) *Deterrence.*—The most basic goal of a civil defense program is to increase the survivability of leadership, people, and economic facilities in the event of nuclear attack. In the strategic environment of the 1980s, a U.S. program which

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makes a significant contribution to this objective can also contribute significantly to deterrence and to crisis stability.

"What counts in deterrence," Secretary Brown has stated, "... is not only what we may believe, but also what Soviet leaders may believe." By their words and actions, the Soviets have shown that they believe civil defense to be a critical element in deterrence. Given their belief, whether warranted or not, in the efficacy of civil defense, they can only perceive the United States as being weaker for the absence of such a program. Given the importance they attach to damage limitation as a necessary element in a deterrent posture, they cannot assign a high level of credibility to a deterrent policy which does not attempt to limit damage to U.S. society if that policy had to be implemented. A substantial asymmetry in survivability between Soviet and American societies in the event of nuclear war can only encourage the Soviets to question the seriousness of U.S. purpose and hence also encourage them to follow a more adventurous policy.

This could be particularly true with respect to Western Europe. In the event of a confrontation with the Soviet Union in which American society were considerably more vulnerable than Soviet society, the credibility of the U.S. nuclear deterrent with respect to Soviet military and diplomatic pressure on Western Europe would be greatly reduced in the eyes of both the Soviets and the West Europeans. This does not imply that this U.S. disadvantage would lead the Soviets to risk lightly nuclear war; it means that their risks of nuclear war would in fact be less and would be perceived to be less in such a situation than if American society were less vulnerable. In an age of strategic parity, the greater the vulnerability of American society, the less the credibility of the U.S. strategic forces as a deterrent to Soviet military action in Europe or elsewhere. A civil defense program designed to enhance U.S. survivability strengthens deterrence by reassuring our allies on the continued meaningfulness of the nuclear coupling and conveying to the Soviets the seriousness of our commitment.

(3) *Crisis Management.*—A meaningful civil defense program could also help to maintain stability, provide additional options, and furnish additional time for negotiation during a major crisis. It could significantly reduce the possibility of the Soviet Union attempting to coerce the United States in such a crisis. In the absence of a population relocation capability, if the Soviets began to evacuate their cities, the United States would be confronted with the alternatives of either launching an attack while the evacuation was in process, thereby initiating nuclear war and the assurance of massive retaliation on vulnerable U.S. population, or allowing ourselves to be placed in a bargaining position vis-a-vis the Soviets in which the more vulnerable U.S. population would be held hostage by Soviet weapons.

Even in the absence of Soviet evacuation, U.S. evacuation might be desirable if the Soviets seemed ready to threaten to use nuclear weapons if the U.S. undertook a conventional counter-intervention in response to Soviet military intervention in a third country. Lacking an evacuation capability, the U.S. in these circumstances would have to choose: (a) either to back down and not use its conventional forces to counter Soviet intervention; or (b) to ignore the Soviet threat and proceed with its counter-intervention at the possible risk of the destruction of its urban population; or (c) to go ahead with its counter-intervention and simultaneously launch its own pre-emptive nuclear strike which, however, would still not prevent a massive Soviet response on U.S. cities. No one of these is exactly an attractive option.

In this connection, it should be noted that quite possibly the most stable situation in a crisis would be one in which neither side had a meaningful civil defense. The least stable situation, on the other hand, is one in which there are marked asymmetries in civil defense capability. An intermediate position in terms of stability involves reasonably effective civil defense postures on both sides. If the United States does not undertake an expanded civil defense program, the least stable situation will exist in a future crisis. An expanded U.S. program, on the other hand, will not only in itself result in a situation making for greater crisis stability; it could also make possible meaningful SALT III negotiations on mutual limitations on civil defense measures by both sides.

(4) *Survivability.*—The central purpose of civil defense is to increase the survivability of leadership, population, and economic facilities in the event of nuclear war. Civil defense programs can contribute to deterrence and crisis stability only if they are perceived to contribute to survivability, and they are most likely

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to be so perceived if in fact they do contribute to survivability. Civil defense programs contribute to survivability only if there is a possibility of nuclear war, and by enhancing deterrence and crisis stability, they also reduce the likelihood of nuclear war. Neither they nor anything else, however, can eliminate that possibility, and it is the reality of that possibility that provides the basic rationale for civil defense.

An overriding goal of our foreign policy is to prevent nuclear war. For thirty years that policy has been extraordinarily successful. We can and must do everything possible to insure its continued success in the 1980s. But we cannot guarantee that success and, as Soviet military power has grown relative to our own, our abilities to deter war, to influence the probability of nuclear war, and to limit the destructiveness of nuclear war to American society have all declined. While people may differ as to the probabilities of their occurring, no one can guarantee that the United States and the Soviet Union will not be involved in a nuclear crisis, a limited nuclear exchange, or even an all-out nuclear war sometime between now and the end of this century. The possibilities of these events happening are all too real.

These real possibilities do not, moreover, necessarily rest on the assumption of evil, reckless, or aggressive leadership in the Kremlin—or in the White House. Such leadership could, of course, emerge and the Soviet Union will be going through a major succession struggle during the coming decade. If it did emerge, the probabilities of a nuclear engagement would increase. But that does not have to happen for those probabilities still to be serious. Some combination of miscalculation, communications failure, inability to understand the other side's motives, a little political short-sightedness, and some bad luck can all too easily produce a pattern of action and reaction from which neither side can escape and which leads to disastrous consequences neither side wants. As President Kennedy observed in May 1961:

"... the history of this planet, and particularly the history of the 20th century, is sufficient to remind us of the possibilities of an irrational attack, a miscalculation, an accidental war, or a war of escalation ... It is on this basis that civil defense can be readily justifiable—as insurance for the civilian population in case of an enemy miscalculation. It is insurance we trust will never be needed—but insurance which we could never forgive ourselves for foregoing in the event of a catastrophe."

The chances of nuclear catastrophe are low, but they are far higher than the chances that anyone of us will be in an airplane accident, aboard a ship that founders, or in a school, factory, or office that is destroyed by fire. Yet we insist on emergency exits on our planes, lifeboats on our ships, and firestairs in our buildings. All these are simply designed to increase survivability in the event of disaster. So, too, is civil defense.

The danger of catastrophe, arising from the unpredictability, uncertainty, and uncontrollability of events, has led the governments of many countries, particularly those which feel exposed, isolated, or vulnerable, to make major investments in civil defense preparations. On an annual per capita basis, many of these efforts far exceed those of the United States. Annual U.S. spending on civil defense alone amounts to about 42 cents per capita; if all civil emergency preparedness activities are included, it comes to about $1.04 per capita. In contrast, Switzerland, Norway, and Israel all spend more than $10.00 per capita per year; Sweden spends about $8.80, the Soviet Union, $7.72, Finland and Denmark each about $4.30, West Germany about $3.45, and the Netherlands about $2.50. Sweden and Switzerland have shelters for over 70% of their population; West Germany has shelters for 10% of its people, with a goal of eventually raising that to 30%. Several of these countries require new houses and factories to include appropriate shelter space. Given the uncertainties and conflicts which are likely to exist in the 1980s, who can argue that these expenditures do not represent a prudent course of action? Is it wise for us to assume that we have some special immunity not vouchsafed to other nations?

IV. THE EFFECTIVENESS OF POPULATION DISPERSAL

Short of the ultimate test of nuclear war, there is no way of estimating with any degree of certainty the effectiveness of any particular civil defense system. Consequently, proponents and opponents of civil defense can—and do—argue endlessly about the probable effectiveness of Soviet civil defense and of alternative U.S. civil defense postures. Much of this argument is highly technical and speculative; it is also not terribly relevant to the broad policy issues at stake.

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With respect to the effectiveness of population dispersal as a means of saving lives in the course of a nuclear war, it is nonetheless possible, I believe, to come to three general conclusions that are supported by the evidence.

First, neither the Soviet civil defense system nor any system which the United States is likely to adopt could make attractive a policy involving high risks of nuclear war. Even with civil defense, an all-out nuclear war would involve destruction of the bulk of the industrial facilities and urban structures in both the United States and the Soviet Union and immediate fatalities numbering in the tens of millions on each side. It would also make highly probable substantial subsequent fatalities resulting from delayed fall-out, the disruption of medical services and food supplies, and the general breakdown of societal infrastructure. For the survivors it would mean immense dislocation, hardship, suffering, and a totally altered pattern of life for a significant period of time. An all-out exchange is, however, considerably less likely than a limited exchange, and the immediate lethal effects of even an all-out exchange would be limited to considerably less than five percent of the total land area in each country. Consequently, even without civil defense, a substantial portion (perhaps half or more) of the population on each side could survive and, in the end, both Soviet and American society could be rebuilt. But the trauma and the loss which would be suffered could never, except in the most extreme circumstances, make recourse to all-out nuclear war a viable policy option.

Second, urban evacuation and population dispersal could significantly reduce casualties and fatalities resulting from an all-out nuclear exchange. Estimates vary widely as to the exact size of that reduction. The range of such estimates for a counterforce and countervalue exchange involving a Soviet first-strike and a U.S. response in the mid-1980s is set forth in Table 2, with the median between the extremes included in parentheses. The effectiveness of any evacuation obviously depends upon: the nature and extent of the planning and preparations which preceded it; the amount of warning time available during which to carry out an evacuation (three to four days being the minimum required and one to two weeks being desirable); and the size and nature of the attack (number and strength of warheads, targeting, and whether weapons are ground burst or air burst). Debatable assumptions and uncertainties thus abound. These estimates do suggest, nonetheless, that effectively implemented evacuation programs could cut in half the immediate fatalities on both sides. For the United States this would mean saving 55,000,000 lives or roughly one-quarter of the total U.S. population.

Third, the effects of evacuation can be reduced but not eliminated by the targeting of relocated population. At present the United States does not target population per se, although it does target major industrial and military facilities located in heavily populated areas. It is reasonable to assume that Soviet targeting follows a somewhat similar pattern. Conceivably, if either side evacuated its population, the other side could, if it was thought desirable and justifiable, target that relocated population. As Table 3 suggests, such retargeting would increase immediate fatalities, but it would not eliminate entirely the savings in lives brought about by the evacuation.

TABLE 2.—POTENTIAL EFFECTIVENESS OF U.S.-U.S.S.R. CIVIL DEFENSE PROGRAMS IN THE MID-1980'S WITH COUNTERFORCE AND COUNTERVALUE ATTACKS

	United States	Soviet Union
Initial survivors (percent of total population):		
Population in place	35–65 (50)	60–80 (70)
Population evacuated	60–90 (75)	80–90 (85)
Immediate fatalities (millions):		
Population in place	75–145(110)	60–110(85)
Population evacuated	20–90 (55)	25–55 (40)

TABLE 3.—IMMEDIATE SURVIVORS OF A MAJOR NUCLEAR EXCHANGE IN THE MID-1980'S

[Percent of total population]

Population status	United States	Soviet Union
In place and not targeted	35–65 (50)	60–80 (70)
Evacuated and not targeted	60–90 (75)	80–90 (85)
Evacuated and targeted	50–70 (60)	70–80 (75)

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V. CONCLUSIONS

These considerations led me to the conclusion which I stated at the beginning of these remarks: a program to develop plans and preparations for the evacuation and dispersal of urban population is a necessary and desirable component of U.S. defense posture in the 1980s. The central thrust of our policy has to be the preservation of our security and that of our allies through the prevention of nuclear war. If that policy should fail, however, possession of an evacuation capability would be absolutely essential in a nuclear crisis, a limited nuclear exchange, or an all-out nuclear war. The development of such a capability requires an increase in our average annual civil defense expenditures between now and 1985 from the current level of about $100 million per year to slightly over $200 million per year, a modest insurance premium of roughly one dollar per person per year. Expenditure of this relatively small sum will enhance deterrence, provide additional options and time in a period of crisis and escalation, and, most importantly, in the event war comes save tens of millions of lives.

In conclusion, there is perhaps a parallel between an evacuation capability for our cities and lifeboats on an ocean liner. The mere fact that the lifeboats exist will not lead the ship's captain to take additional risks with his ship in bad weather or treacherous seas. Nor will the lifeboats prevent the ship from being totally destroyed by collision with a reef, iceberg, or other vessel. Nor will the lifeboats necessarily insure even the immediate survival of all the people on board. Nor will they necessarily insure the prolonged survival of those who do successfully abandon the ship in them: the lifeboats themselves may be swamped; supplies may give out before the survivors are rescued; exposure, injury, and exhaustion may take their toll. Nonetheless, the lifeboats do offer the prospect that, in the event the ship sinks, at least some people will survive for somewhile and that with luck a good number may survive to sail again in another vessel. In any event, no one would want to cross the oceans in a ship without lifeboats. In parallel fashion, simple prudence dictates that the United States should not attempt to cross the uncertain and troubled waters of the 1980s without the capability to evacuate its urban population in the event of catastrophe.

The CHAIRMAN. Thank you very much, Dr. Huntington.

Dr. Huntington, I'm just going to take a couple of minutes to depart from the thrust of our hearings, because I was so surprised—perhaps I should not have been—by the statement by Mr. Warnke that failure to ratify SALT would mean that we would have to spend $6 billion on strategic weapons—I think ratifying SALT is probably the best thing we could do to combat inflation.

The No. 1 domestic issue is to ratify SALT, for that reason, because I can't think of any place, any expenditure that would be more clearly and conspicuously inflationary than to spend it on any kind of military hardware of any sort—not that we don't have to spend it there; we obviously do, to defend the country.

But, at any rate, I think that was a most interesting conclusion by Mr. Warnke.

Now, you put a lot of your emphasis on the fact that the Russians developed a civil defense program that is much more substantial than ours.

Isn't it obvious why the Russians have done this, in the first place? Their cities are more vulnerable; their people are more concentrated; they don't have the kind of suburban sprawl that we have. That gives us an advantage in this area.

They don't have the automobiles that enable them to move more readily. We evacuate about a third or a half of our cities every night between 4 and 7. We have all kinds of practice evacuating our cities.

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The Russians have been more defense minded than we have been, or than almost any other country has been with respect to military threat. This has been true in all kinds of areas.

Overall, I am surprised, as was Mr. Warnke, that their civil defense effort does seem to be relatively modest. It is 1 percent of the defense budget. It obviously is very limited. It doesn't provide for the protection of the overwhelming majority of their workers or of their people, although it does provide protection for their leaders.

What is your response to that?

Dr. HUNTINGTON. I would not describe the Soviet civil defense effort as modest, except in the context of the restricted resources which exist in the Soviet Union. I think, as you point out, they have a much more difficult problem in providing for evacuation than we do. And in fact, some people have suggested that we really don't need a civil defense program and planning for evacuation, that this will happen spontaneously. But, I think we all know if it happened spontaneously, what sort of a mess we would end up in.

And part of the program which has been envisioned by the administration is precisely to make plans for the reception of evacuees in areas and to stock supplies, and other things, in order to make the evacuation effective and in order to capitalize on the advantages which we do have when it comes to evacuating a city.

As I indicated in my statement, Mr. Chairman, the Soviet civil defense program, it seems to me, fits in with their overall strategy, which is very much a damage limiting strategy. And they have to, given their scarce resources, balance off how much money they should put into civil defense, how much they should put into their huge air defense system designed against our bomber force, and how much money they should put into their offensive.

The CHAIRMAN. And they end up putting only 1 percent in civil defense. That doesn't sound like very much.

Dr. HUNTINGTON. They put an estimated 10 percent of their strategic budget into civil defense. That is a good healthy portion of their strategic budget.

The CHAIRMAN. Now, Mr. Warnke said, and I quote: "The Soviets should not be judged so blind and reckless as to assume that any present or prospective shelter program or any hopes of speedy evacuations to safe zones would make it possible for them to utilize strategic nuclear war as a means of achieving political objectives."

Now, you, on the other hand, said that the Soviets have shown that they believe civil defense to be a critical element in deterrence, and that not having a symmetry in survivability would encourage them to follow a more adventurous policy. What is the reason for your difference in evaluation?

Dr. HUNTINGTON. I do not believe that the Soviets would willingly attempt to use or resort to nuclear war in order to achieve political goals unless they felt that the very survival of their system was at stake. I think I would agree with Mr. Warnke. I think both sides agree that nuclear war would just be a terribly devastating affair for both sides. On the other hand, I think that, as I indicated, that they do believe that they can limit the damage to their society. They do feel they have to, in the context particularly of fighting a war in Europe, de-

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velop their capabilities to maintain and supply the Soviet forces advancing westward into central Europe. Their civil defense program is, to a very large degree, oriented along those lines, and consequently they feel that it makes a great deal of sense for them.

And I am not urging that we should try to duplicate the Soviet civil defense program here.

The CHAIRMAN. How big a program do you recommend?

Dr. HUNTINGTON. I would recommend an expansion of our efforts in the area of population evacuation and dispersal, moving toward a doubling of the present level of spending in that area, from roughly $100 million to roughly over $200 million, which over a period of 5 to 7 years would give us a substantial evacuation capability, if it should be necessary to do so.

The CHAIRMAN. Well, I don't know. You know, I listen to what you say and I will listen to what Mr. Warnke says, and I'm not sure you are so far apart. You're not advocating a great deal, then.

Dr. HUNTINGTON. No; I'm not.

The CHAIRMAN. You're not advocating that we go into the kind of project that Mr. Jones, of Boeing, was advocating before this committee a couple of years ago, that is, hardening our industrial sites and so forth. You're advocating primarily an evacuation program.

Dr. HUNTINGTON. That's right.

The CHAIRMAN. Would you have drills? Would you have some kind of tests?

Dr. HUNTINGTON. Well, I think both sides, both countries, have in the past had various forms of civil defense drills and tests. To the best of my knowledge, no one has ever tried to, as a civil defense drill, tried to evacuate a large city. But both sides do carry out tests of various sorts involving civil defense organizations, as we did in the 1960's and the Soviets do now—and I would think that expanded types of tests would certainly be appropriate.

The CHAIRMAN. Was there a dollar figure attached to Presidential Decision 41?

Dr. HUNTINGTON. PD-41 dealt with general policy.

The CHAIRMAN. It did not have a dollar figure?

Dr. HUNTINGTON. No.

The CHAIRMAN. Since our current strategic policy is to target economic and military functions rather than the population, why would Soviet population protection measures alter the strategic balance at all?

Dr. HUNTINGTON. Well, I think it would. I think the Soviet civil defense program alters the strategic balance in the sense that it will increase significantly, if it can be implemented, the survivability of Soviet leadership and population. Mr. Warnke, in that connection, made the statement that deterrence depends on the certainty that unacceptable damage will be done to the potential aggressor. I think that can work both ways, and that is the reason why I am concerned about the interaction between the vulnerability of our ICBM force and the Soviet civil defense effort. If our ICBM force is vulnerable—and unlike Mr. Warnke, I think all the evidence suggests that it is increasingly vulnerable—then a Soviet attack or threat of an attack on the ICBM force could put us in the position where we would never

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make a second strike, because we would be deterred precisely for the reason that Mr. Warnke suggests, the certainty that unacceptable damage would be done in return.

The CHAIRMAN. You say our deterrent force is vulnerable to the point of their being able to—maybe I misunderstood you—take it out?

Dr. HUNTINGTON. I said that all the evidence suggests that our ICBM force——

The CHAIRMAN. That's only one leg, not our submarine force, not our air deterrent.

Dr. HUNTINGTON. No.

The CHAIRMAN. Well, in view of that, after all, we would still be able to inflict overwhelming damage——

Dr. HUNTINGTON. My point is——

The CHAIRMAN [continuing]. On every Russian city and level it, and still be able to kill tens of millions of Russians.

Dr. HUNTINGTON. That's right. But my point is that under the criterion of deterrence as stated by Mr. Warnke, we would not do that because they could do it to us, after, let us suppose—and we are talking in speculative scenarios now—after they had taken out a substantial part of our ICBM force.

The CHAIRMAN. I did not understand Mr. Warnke to indicate that. Do I understand that you understood him to say that after they initiate a first strike, and if they were successful in taking out our ICBM's, that we would not retaliate with our air and underwater deterrent?

Dr. HUNTINGTON. I'm saying that Mr. Warnke's criterion of deterrence, which was the certainty that unacceptable damage will be done in return, we would not retaliate, because we would suffer unacceptable damage in terms of the devastation of our cities after we had struck at the Soviets.

The CHAIRMAN. Well, I understood Mr. Warnke's assumptions to all be posited on the notion that they would be in a position to have the first strike, from there on we would retaliate. I can't imagine any President of the United States not retaliating if they hit us.

Dr. HUNTINGTON. I don't want to seem to be in a position of debating with Mr. Warnke, because I'm not. All I'm doing is taking his criterion as to what constitutes effective deterrence, and applying it not against the Soviets but against the United States. And I'm saying that if the Soviets attacked our ICBM force and substantially eliminated the bulk of that ICBM force, in an attack that would cause some, but relatively small, casualties and fatalities in the United States, a very low order of fatalities, that we could well be deterred from then striking against Soviet cities because the Soviets then could in turn retaliate and utterly devastate American cities.

The CHAIRMAN. What you're doing is arguing a postattack deterrent, something I think Mr. Warnke did not discuss, at least not this morning.

Dr. HUNTINGTON. I'm not interpreting Mr. Warnke. I'm simply taking his criterion.

The CHAIRMAN. What you're doing is taking his assumptions that he made before a first strike. After a first strike, he did not tell us what his view was. I would think that the view of many would be that after a first strike we would retaliate.

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Dr. HUNTINGTON. Even if this meant total devastation of American cities and population?

The CHAIRMAN. Well, I think we would retaliate.

Dr. HUNTINGTON. It is not a pleasant situation to be in.

The CHAIRMAN. Well, of course not, heaven knows. But the country's position after a first strike is not a pleasant one to be in.

Senator LUGAR. In reciting the history of post-World War II with regard to the Soviet Union, you mentioned that the Soviets did not feel that they had nuclear parity for a while, and thus the intensified civil defense activities were logical so long as they feared that we might be willing to use nuclear weapons to enforce what we thought was desirable. Furthermore, you cite the Brookings study, which states that between 1946 and 1973, the United States used nuclear forces some 19 times as an instrument of its diplomacy, with 14 of these cases involving the Soviet Union.

I think that this is an intriguing point, suggesting that we were in fact using nuclear weapons for strategic purposes, and at least Brookings would feel we were using them with some success—19 times, and 14 of those times were with the Soviet Union. Now, you point out, however, on page 8 and I quote:

> Our monopoly of this diplomatic gambit is now gone, and it is clear that Soviet leaders appreciate the military uses to which nuclear forces can be put. They have not missed the lessons of the Berlin crisis, the Cuban missile crisis, and the October war.

These are specific examples in which our nuclear superiority may have been very important. But you point out that, where they might have used civil defense purely to sort of shore up morale and their general posture prior to this nuclear parity, it is now clear that the civil defense effort may have another purpose; namely, to extend its own strategic situation. As a matter of fact, we no longer have a monopoly on this gambit, as you called it, but they, too, can play the game. In fact, as opposed to simply trying to catch up, they appear to be doing it even more in this respect.

Now, leaving aside all these shootout scenarios that we have just been discussing, if Brookings is right that 19 times in this period of 27 years or so, nuclear strategic play came into focus and made quite a difference in the foreign policy of this country and maybe in world events, what is your counsel to this country in regard to civil defense? How are we to now counter what the Soviets have done in accelerating the buildup of strategic weapons with the civil defense moving along in complement to it, so that they may use a nuclear diplomatic gambit? We must examine not only a shootout, but rather the possibility of one: the threats, the hints, the staveoffs.

What is the specific action that we ought to be taking on the civil defense side in order to counter that aspect and move back at least to greater parity with them, or in fact to negate whatever they are doing?

In your testimony, you mentioned four reasons for involvement in civil defense, and this answers the question in part. But I would like for you to go beyond that, if you could, and extrapolate on the type of programs that should occur and discuss how they should be

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publicized so that they will be perceived correctly by the Soviet Union and others?

Dr. HUNTINGTON. As I indicated, I think the key element in an expanded civil defense program should be developing the capability to evacuate cities and disperse population. And as I said, I think by focusing on that, by developing the plans and preparations and over the period of time, for a very modest investment, as compared to a defense budget of well over $100 billion, for a very modest investment we can get a great deal in return.

I think there are possibly two other areas which should be also looked into. One is the problem of insuring the continuity of Government. As you know, there are facilities that have been built to provide for the protection of governmental leaders. Most of these were built many, many years ago, in some cases a couple of decades ago. There is a problem of command and control during the crisis, and more attention should be devoted to that.

Then, second, I think it would be desirable to undertake some studies of the desirability and the feasibility of inaugurating a Federal program which would require or provide incentives to people to build shelter facilities in new residential and business construction. One of the more worrisome things, I think, about the Soviet civil defense program is that they are proceeding not just with evacuation, but with the construction of blast shelters in their cities and near their factories. If this should continue, and there is every indication that it will continue, over a substantial period of time, they will be able to protect a very large proportion of their population in place. This would then change the situation, because I think everybody recognizes that for them to evacuate or for us to evacuate now in any significant way will take 3 to 4 days to a week or two at best. But if they can put a substantial portion of their population in blast shelters in 6 or 8 hours, that does change the situation.

They obviously can't do that now. But what I'm saying is, I think it might be desirable from our point of view to look carefully—to study carefully the possibility of providing incentives for the incorporation of shelters in new construction. Several European countries already do that.

Senator LUGAR. A year ago in January, when I was a part of the congressional delegation to China, the Chinese leaders in Peking took great pains in pointing out to us, and I presume they have done so for many folks who have visited there, the underground shelters they were constructing. There was some skepticism as to how extensive the shelters are. There's no doubt as to the intent, I would guess, of the people in showing us those shelters. Namely, they felt that it was necessary at that point to begin making extensive preparations with regard to a potential nuclear attack from the Soviet Union, which they felt was inevitable in the course of history.

Now, what comment would you wish to make? We have dealt primarily with the Soviet Union and only tangentially with China. But why would the Chinese be proceeding in such ways? Is it a rational course for them?

Dr. HUNTINGTON. I think, Senator Lugar, there is evidence from a number of reports from a number of Chinese cities that the tunnels

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are being built; people have been escorted through tunnels in at least three or four different Chinese cities. So I think one has to assume that it is a fairly extensive system.

I can only speculate as to the reasons that they have done this. But it seems to me that in their situation, where they share a border for thousands of miles with a country that is very much their enemy and that has, as compared to the Chinese nuclear capability, overwhelming superiority, that the logic for them building a civil defense program is very similar to the logic of the Soviets building a civil defense program in the 1950's and early sixties when we had overwhelming nuclear superiority.

Senator LUGAR. And they will do this even in the face of testimony today that these sorts of programs really don't do a whole lot of good? In other words, if you were to take some of the testimony that we have heard today, it would suggest that the Chinese are simply wasting their time and money, given the priorities of their society. But apparently they have decided that this is not so, and you have suggested this has been done for the same reason that the Soviets did so in the fifties, given a large disparity. But you have also suggested that the Soviets, having progressed beyond that point now, have other means or objectives in moving ahead in civil defense, and that that is a corollary with their strategic strength.

Let me ask you the final question that I asked Mr. Warnke: In the event that the SALT treaty is not adopted, how much should we spend on civil defense, or does that change the equation, in your judgment?

Dr. HUNTINGTON. I think it would all depend on the atmosphere which existed at that time, on the nature of our relations with the Soviets at that time. As I have indicated, I think we should go ahead, whether or not SALT is approved, and I think it should be. But in any event, we should go ahead with a modest upgrading of our civil defense program. And I just wouldn't want to speculate as to whether, in the event of a SALT treaty not being approved, whether we should do more than that.

Senator LUGAR. Thank you.

The CHAIRMAN. I just have a few more questions. Mr. Huntington, Mr. Warnke argued that a completely effective Russian evacuation could be negated by a simple retargeting of American weapons. What is your response to that?

Dr. HUNTINGTON. Well, I don't think the evidence really supports that proposition. I believe there is, on page 19 of my statement, some estimates of what the effect of retargeting would be. It obviously makes some difference. It would increase the fatalities which would occur if the evacuated population was not targeted.

The CHAIRMAN. Well, let's take a look at that table. That table shows in-place and not targeted, Soviet Union, 60 to 80 percent; evacuated and targeted, 70 to 80 percent. So the difference is not very great, or am I looking at the wrong figures?

Dr. HUNTINGTON. No; you are looking at the right figures. The difference exists in terms of—I think we have to recognize that, as Mr. Warnke suggests, all the statistics which you have heard and will hear are based on a wide variety of assumptions, and involve large ranges——

The CHAIRMAN. Did this come out of the PRM–32 study?

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Dr. HUNTINGTON. These figures reflect estimates that were prepared in connection with the PRM–32 study. And I might say, Mr. Chairman, if I may, that the ranges of estimates which are indicated in this table and in the other table in my statement indicate the very wide range which different governmental agencies can come up with when they are trying to calculate these things. But I think, as those figures indicate, there would still be, with the evacuation of the population and the targeting of Soviet population—the mean would still come up somewhat from 70 percent to 75 percent. I think the main point about that, however, Mr. Chairman, is that, as you suggested in your earlier comments on this point, it would not really be in the interest of either the United States or the Soviet Union, in a situation of this sort, to target the evacuated population.

They would still—and particularly the Soviets—would give primary emphasis to our military facilities, both nuclear and nonnuclear, and to our industrial facilities and to our recovery facilities, and that would still be the principal target.

The CHAIRMAN. Mr. Warnke argued the real danger to stability comes from indulgence in the illusion that effective civil defense is possible. In other words, we get the feeling that we can afford, or they get the feeling that they can afford, to indulge in a nuclear exchange because our people are protected.

What is your answer to that?

Dr. HUNTINGTON. I just can't believe that any rational person would think that any contemplated civil defense program in this country or the Soviet civil defense program would make nuclear war a viable option of national policy.

The CHAIRMAN. Now, when you say that, when you make that statement, isn't that the strongest argument against spending money on civil defense?

Dr. HUNTINGTON. No; I don't think so.

The CHAIRMAN. It wouldn't have any bearing one way or another on preventing nuclear war.

Dr. HUNTINGTON. I think it might, in some measure, strengthen our deterrent. I think the principal reason for a civil defense program is that while we don't want to have a nuclear war and the Soviets don't want to have a nuclear war, providing each of us can achieve our objectives through other means, and it would clearly have to take overwhelming feeling of fear and necessity that the central values of each system were at stake and under threat some other way, to lead us to engage in nuclear war; nonetheless, there is a possibility miscalculations can occur. We do stumble into confrontations between ourselves and our opponents. We all know the histories of how other wars—World War I, among others—have gotten started. And it seems to me that as an insurance policy it is just prudent to engage in what I think is really a modest improvement in our civil-defense posture.

The CHAIRMAN. Let me make one other try at this. It has been said that the strategic balance would be destroyed if one side could fend off acceptable damage to its people while the other side could not.

What do you think the Russian leaders would consider to be unacceptable damage? Would a U.S. retaliatory attack killing 30 to 40 million people and destroying 60 to 70 of their key industrial facilities be acceptable?

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Dr. HUNTINGTON. I think it would depend upon the circumstances. I think any destruction——

The CHAIRMAN. Tell me what conceivable circumstances there are that would make that kind of overwhelming destruction acceptable.

Dr. HUNTINGTON. To the Soviets?

The CHAIRMAN. Yes.

Dr. HUNTINGTON. I think that they would, if it was a choice of accepting that sort of destruction in their own society or tolerating a change in the situation in central Europe with respect to East Germany or Poland, they would choose the latter. They would go to nuclear war to prevent that and risk those casualties.

The CHAIRMAN. What makes you say that?

Dr. HUNTINGTON. I think that they feel that their entire position in the world, the viability of their political system, depends upon their maintaining control in Eastern Europe, and if it was a case of having to go to nuclear war and suffer fatalities of that character in order to maintain that control, I think they would.

The CHAIRMAN. So that if there should be revolutions in Eastern Europe against the Communist regimes and there were any assistance from this country, in your view they might very well go to war?

Dr. HUNTINGTON. I think they would have to very seriously consider that.

The CHAIRMAN. How widely held is that view?

Dr. HUNTINGTON. I don't have the slightest idea.

The CHAIRMAN. Are you familiar with the recent study by the Arms Control and Disarmament Agency, called "An Analysis of Civil Defense in Nuclear War"?

Dr. HUNTINGTON. Yes; I have seen it.

The CHAIRMAN. Do you agree with their findings?

Dr. HUNTINGTON. Not entirely at all, no.

The CHAIRMAN. Where do you disagree?

Dr. HUNTINGTON. Well, I don't have the study immediately before me, Mr. Chairman. I wouldn't want to have to try to specify as to exactly where I disagreed.

I would like to say, however, that that study was one of a variety of different studies.

The CHAIRMAN. It was one of what?

Dr. HUNTINGTON. It was one of a variety of different studies which were prepared in the context of PRM-32, and, consequently, you will find that there are other studies which had rather different estimates and come to rather different conclusions. And the figures which I have given in my statement, all of which include a range of fatalities and survivors, as I say, suggest the differences of viewpoint which can exist.

The CHAIRMAN. Well, it was a little unfair to ask you to comment on that since you had not seen it for a while. But would you take a look at that and then, submit for the record, the five or six or seven principal differences that you may have with it, when you correct your remarks.

Dr. HUNTINGTON. I would be delighted to.

But I would like to emphasize that this represents one study based on one set of assumptions and one set of analyses, and there are others

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which come to somewhat different conclusions in terms of the figures and which start off from different types of assumptions.

[The information follows:]

SUPPLEMENTARY STATEMENT BY DR. SAMUEL P. HUNTINGTON COMMENTING ON THE ACDA REPORT, "AN ANALYSIS OF CIVIL DEFENSE IN NUCLEAR WAR"

Both the Defense Civil Preparedness Agency and the Boeing Corporation have, I understand, submitted detailed critiques of the ACDA report. I shall consequently limit my comments to four general points.

1. This ACDA report presents in summary fashion some of the analysis and conclusions contained in four classified reports which ACDA contributed to the PRM–32 study of civil defense. The Federal Preparedness Agency, the Office of Program Analysis and Evaluation in OSD, the Central Intelligence Agency, and the RAND Corporation also prepared reports which cover many of the same issues and which were also used in the PRM–32 study. The ACDA report is thus only one of a number of analyses of these highly controversial issues; unlike the final overview report for PRM–32, it was never submitted for interagency review; it remains the statement of one particular agency at one particular point in time; much of its analysis and many of its conclusions are different from and have been contradicted by the reports of other agencies. It is, thus, in no sense an authoritative statement of the views of the U.S. Government.

2. The ACDA report tends to convey a spurious impression of precision and accuracy. While its authors admit that many of the possible effects of a nuclear exchange "are difficult to measure and simulate on computers," they nonetheless attempt to do exactly that and where computer simulation is possible to ascribe great authority to the results that are produced. These analyses, however, deserve to be treated with great caution and skepticism. With slight variations in assumptions and input data, studies by other agencies produce significantly different results. The world fortunately has had no experience with nuclear warfare since 1945, and a high degree of intellectual humility is required in attempting to predict what the nature and consequences of such warfare would be now. I do not detect that humility in many of the seemingly-confident predictions contained in the ACDA report.

3. The ACDA report is directed primarily to an analysis of the effects of nuclear war on the Soviet Union, not the United States. This analysis rests on very optimistic assumptions (from the U.S. viewpoint) as to the ineffectiveness of Soviet civil defense with respect to: (a) the evacuation and dispersal of urban population; (b) the protection of evacuees against fall-out; and (c) the protection of evacuees against fall-out; and (c) the protection of industrial machinery. These assumptions are challenged as unrealistic by critics of the report. In the absence of a nuclear crisis, we will not know conclusively whether or not the assumptions are justified. Given this uncertainty and the consistent optimistic "tilt" of these assumptions, however, the United States clearly would not be justified in basing its policy on an analysis resting solely on these assumptions.

4. The general import of the report and the interpretation given to it by ACDA officials is that nuclear war will be so horrible that no feasible civil defense effort could make much difference to the outcome of such a war. The lessons which should be drawn from an analysis such as ACDA's, however, are that: (a) the U.S. should do everything possible to prevent nuclear war; (b) since we can never be certain nuclear war will be avoided, we should take whatever reasonable steps we can to mitigate its consequences. Even ACDA's analysis indicates that civil defense, particularly evacuation, can make a difference. By evacuating its cities before a mid-1980s exchange, for instance, the Soviet Union could, by ACDA's figures, reduce its fatalities from a level of roughly 84,000,000 to roughly 28,500,000. If at that time the United States did not have an evacuation capability, U.S. fatalities would be roughly 116,500,000. In short, even by ACDA's figures, if the Soviets implemented their civil defense plans and we lacked a comparable capability, almost 90% of the Soviet population and less than 50% of the U.S. population would survive a nuclear exchange in the mid-1980s. These figures, like others, must be treated with caution, but they surely establish a firm basis for believing that civil defense *could* make a difference involving tens of millions of lives. Given this stake, the development of an effective U.S. evacuation capability by the mid-1980s clearly warrants investment of the $200 million a year it would cost.

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The CHAIRMAN. Now, I asked Mr. Warnke this question, and I would like to ask you, too: Do you believe that we should develop a civil defense program to use as a bargaining chip in the next round of SALT negotiations?

Dr. HUNTINGTON. I think that if we are going to seriously consider civil defense as an element to be negotiated in the SALT III round, I don't think we can get anywhere with the Soviets so long as they have a substantial defense program and are building shelters and developing evacuation plans, and we are not.

The CHAIRMAN. We start off with a big, fat assumption: You said "if we are going to consider civil defense as an element to be negotiated in the SALT III round. . . ."

Should we consider it? Can you answer that question, first?

Dr. HUNTINGTON. Well, I don't think there is any point in trying to negotiate with the Soviets on civil defense if they have a program and we don't, because they are not going to give it up.

The CHAIRMAN. Do you believe we should develop a civil defense program as a bargaining chip?

Dr. HUNTINGTON. I believe we should develop our civil defense program, whether or not it is a bargaining chip. And I would not make the argument for civil defense primarily because it might be a bargaining chip, but it seems to me that if we do go ahead and expand our civil defense program, we would then be in a position in the SALT III negotiations during the coming years to propose some limits—reductions, perhaps—in that area of activity.

The CHAIRMAN. Well, you are only proposing a $200 million program, a modest program, a program primarily emphasizing evacuation. Do you think that would be any kind of a basis for bargaining with the Soviet Union?

Dr. HUNTINGTON. I think if we went ahead with the program, such as I have indicated, that at the end of 5 or 6 years we would have an evacuation capability which would put us into a position where we could save more or less the same proportion of our population as the Soviets could save with theirs, provided both programs were implemented effectively.

The CHAIRMAN. I want to commend you, too, Dr. Huntington. You have a most distinguished career, both at Harvard University and in serving our Government, and we are very grateful to you for the fine work you have done and for your excellent testimony this morning.

Dr. HUNTINGTON. Thank you very much.

The CHAIRMAN. We have three other witnesses that we are going to hear at 2:30 this afternoon. I think it would be an imposition to keep them here. We have many questions for them.

So, the committee will stand in recess until 2:30, when we will reconvene to hear our final three witnesses.

[Whereupon, at 12:15 p.m., the hearing was recessed, to be reconvened at 2:30 p.m., this same day.]

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AFTERNOON SESSION

The CHAIRMAN. The committee will come to order.

Thank you, gentlemen, very much for your patience, and I apologize for not being able to stay this morning so I could conclude the hearing. But with the five witnesses and three Senators who are here, it was difficult.

We are honored by your presence. I am going to introduce each of you now and ask each of you to give your statement, and I hope you will be able to limit your statement to approximately 10 minutes or less, because that will make it much easier to conclude the questioning at a reasonable time.

Our first witness is Mr. Spurgeon M. Keeny, Jr., who is deputy director of the Arms Control and Disarmament Agency. Previous to his appointment in 1978, Mr. Keeny was director of policy and program development for the Mitre Corp. Mr. Keeny has also served as a senior staff member of the National Security Council and technical assistant to the President's science adviser, and chief of the Atomic Energy Division of the Office of the Assistant Secretary of Defense for Research and Engineering.

Mr. Bardyl Tirana is director of the Defense Civil Preparedness Agency. Previous to his appointment, Mr. Tirana was a partner of the Washington law firm of Sundlun, Tirana & Scher, and cochairman of the 1977 Presidential Inaugural Committee.

Then we shall have Dr. Drell, who is one of the country's foremost nuclear physicists. He is the deputy director of the Stanford Linear Accelerator Center at Stanford University. He serves as consultant to the National Security Council and several Government agencies. Dr. Drell is a former member of the President's Scientific Advisory Committee and a consultant to the Congressional Office of Technology Assessment.

Mr. Keeny, go right ahead, sir.

STATEMENT OF SPURGEON M. KEENY, JR., DEPUTY DIRECTOR, ARMS CONTROL AND DISARMAMENT AGENCY

Mr. KEENY. Mr. Chairman, I am pleased to appear before this committee in response to your request to discuss civil defense.

At the outset, I would like to point out that, while the Arms Control and Disarmament Agency does participate with other agencies in the the process of shaping our policy on civil defense, we are not directly involved in the development or the execution of civil defense plans and programs. Our interest in civil defense focuses on its role in the overall United States-Soviet strategic balance and its potential impact on arms control agreements. As part of our analysis of this problem, we recently completed a study of the effectiveness of civil defense in a nuclear war involving the United States and the Soviet

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Union, with particular emphasis on the possible effectiveness of potential Soviet civil defense programs. At the committee's request, I am submitting for the record the unclassified version of the report and making available to the committee the complete classified version of the report. (See p. 269 for unclassified version of report.)

As the committee is well aware, the debate over the value of civil defense is not a new subject. Much of the ground we are discussing today was covered 20 years ago in studies, in some of which I happen to have been involved at the time. Many other studies have been conducted since then, including a number of major studies in recent years. The specific results of these studies differ, depending on the assumptions made with respect to the nature and scope of Soviet measures to protect population and industry and the characteristics of the hypothetical nuclear attack used in the analysis. While these studies all conclude that Soviet civil defense measures, if they worked as planned, would have some value in saving lives, the central question remains as to what strategic significance, if any, such programs have.

In an effort to clarify the quantitative parameters of this issue, we focused our recent study on what civil defense could do for the Soviet Union in the mid-1980's. In our analyses we assumed a Soviet first strike against U.S. strategic forces, against other U.S. military targets, and against U.S. industry. The United States was assumed to retaliate with its surviving forces (except for a 10- to 15-percent reserve) against a similar set of Soviet targets. In this representative U.S. retaliation, the bulk of our surviving weapons was used against Soviet military targets and only a portion against Soviet industry.

If the Soviets do not evacuate their cities, our studies indicate that with U.S. forces on normal day-to-day alert status, without targeting the civilian population per se, and even if the best available urban shelters were filled, some 60 million people would be killed in the Soviet Union by the short-term effects of such a retaliatory attack. If U.S. forces were on "generated alert," then the Soviet fatalities from the short-term effects alone would be over 80 million.

Evacuation of a large portion of the Soviet urban population could reduce immediate fatalities but would assure that U.S. forces would be on "generated alert." However, even with successful evacuation of 80 percent of the urban population and best available shelters for the remaining 20 percent, the number of Soviet fatalities from the short-term effects would still be 25 to 35 million, assuming no change in U.S. targeting philosophy. However, if the United States were to respond to this Soviet civil defense strategy by ground-bursting instead of air-bursting nuclear weapons, thereby creating more fallout over the Soviet Union, there would be 40 to 50 million Soviet fatalities. If, in addition, the United States were to retarget some of the weapons designated for military targets or use our reserve weapons against the evacuated population, then 70 to 85 million people would be killed. In their own assessment of the nature of our retaliatory strike, the Soviets presumably would give considerable weight to the steps the United States could take to counter a massive civil defense strategy.

We have been unable, as has everyone else, to provide a quantitative assessments as to the fate of those who might survive the short-term effects of such a war. While it is not clear how the survivors would

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manage, we did investigate the condition of the Soviet Union after the attack. We found that, simply by virtue of associated industrial and military targets, all of the 200 largest Soviet cities and 80 percent of the 886 Soviet cities above 25,000 people were attacked in our simulation; that 85 to 90 percent of the urban housing in these cities would be burned out; and that typical cities would be covered with radiation doses from 5,000 to 30,000 roentgens—immense doses in view of the fact that 200 roentgens produces a 50-percent chance of radiation sickness and 450 roentgens a 50-percent chance of fatality.

The industrial portion of the attack simulated in our study was almost equally devastating, destroying 65 to 70 percent of key Soviet production capacity. with U.S. forces on normal day-to-day alert status. This destruction level went up to 85 to 90 percent with a fully generated U.S. force status. Attempts at industrial hardening are extremely costly and of marginal utility because of the destructive capability of modern nuclear weapons. Furthermore, serious efforts to harden industrial facilities can be counterbalanced by detonating weapons at lower altitudes, thereby creating much larger overpressures. Finally, the new nuclear weapons entering the United States inventory will have greater destructive power than current weapons. This, together with greater accuracy, should more than compensate for the effects of any industrial hardening the Soviets might attempt. There is actually little evidence of such Soviet activity.

Our study also addressed U.S. fatalities from a Soviet attack, and concluded that they would be even higher than Soviet fatalities, for two reasons unrelated to civil defense: The study assumed a Soviet first strike; and the Soviet Union has higher yield weapons, which result in more fallout.

This is so despite the fact that the United States has greater dispersal of urban population than the Soviet Union and a much more extensive road network and transportation capability.

As I indicated earlier, the longer term consequences of a nuclear attack cannot be quantified in the same fashion as the immediate effects. It is important to emphasize, however, that the longer term survival rates and the capacity of the civil society to regenerate itself would be severely affected by a number of additional interacting factors. These factors include:

The need for survivors to remain in shelters for weeks or months in order to avoid the effects of radiation, while shortages of food and water would force many out of the shelters during that period;

The need to care for several tens of millions of injured people and unknown number of disease victims in an environment where the health care system would not be functional;

The effect on the life expectancy of survivors of high levels of radiation exposure;

Enormous destruction of livestock and contamination of food-growing areas; and

The possible long-term consequences to the natural environment resulting from destruction of the ozone layer.

A great deal more study of these complex problems is necessary before their full impact on the surviving society can be realistically evaluated. The one thing that is certain is that the effect of these factors will greatly increase the cumulative fatalities of a general nuclear war.

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In summary, a well-planned Soviet civil defense program could reduce the number of short-term fatalities in a nuclear war between the United States and the Soviet Union. Yet, even a Soviet civil defense program, far more massive and effective than that indicated by current intelligence would not limit the immense population loss and the overwhelming destruction of the economy and society enough to alter significantly for the Soviet Union the overall consequences of initiating a nuclear exchange. No observed or feasible Soviet civil defense effort could render a large-scale nuclear war anything but an unparalleled disaster for the Soviet Union. We see nothing that indicates the Soviets have a contrary view. Thus, although civil defense may be a factor in the perception of the broader strategic equation, it is vastly overshadowed in importance by the forces and the war plans of the opponents.

The CHAIRMAN. Thank you, Mr. Keeny. And now Mr. Tirana.

STATEMENT OF BARDYL R. TIRANA, DIRECTOR, DEFENSE CIVIL PREPAREDNESS AGENCY

Mr. TIRANA. Mr. Chairman, I would like to limit my opening remarks to a description of the current United States civil defense capability, and that is to say we don't have much. I took office nearly 2 years ago. I barely knew what the words "civil defense" meant and had to ask the question, "What am I supposed to do?" And I was told, "Carry out the Civil Defense Act of 1950." And then the next question was, "What did that require me to do?" And the answer was, "To protect the population of the consequences of a possible nuclear attack." A follow-on question was, "Are we doing it now? And if we are not, how do we do it?"

I found that from the time of the Cuban missile crisis, or at least the early 1960's, civil defense was largely ignored. At that time there had been a large-scale effort to provide inplace shelter against what was a potential early-1960's Soviet threat, obviously far less of a potential threat than would exist today or in 1985 or in 1990.

I found that what may have existed in the 1960's would be very, very ineffective in terms of the number of Soviet weapons that now exist and their potential delivery. We see shelter signs all around the country, and in this building and in the Pentagon. They might have provided or would provide protection against fallout, but certainly would not provide protection against blast and fire.

I asked my staff, who were exceptionally capable, what the 15 or 30 years of effort of civil defense would do in the event of a large-scale nuclear exchange between the Soviet Union and the United States, and their objective answer is that it might add 8 to 10 million survivors to those who would survive by accident. In short, all of those decades and years and hundreds of millions of dollars have not bought very much.

The question for the Congress and the President is, "What do we do now? Do we continue to do what we have been doing in the past, which is, in essence, to spend $100 million a year, so that we can say we have a civil defense program, when, in reality, we don't? Can you provide a defense against the bomb, knowing, as we should, that the bombs can melt cities, and what people used to perceive safe shelter is no longer shelter?"

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The alternatives seem to be three: Continue to do nothing or little. Second, to design a system to get people away from the bomb in the event of an attack because the best defense against the weapon is to not be there in the first instance. Or third, to build blast shelter, but the cost of that is extraordinary. Our estimates would run at least $60 billion.

The only logical answer, it seemed to my staff and me, would be to develop a genuine civil defense capability through relocation. And that is something that the Secretary of Defense approved as an objective at the end of 1977, subject to policy and budget review by the President.

The policy decision was made by the President in September of 1978, and you have heard testimony on that this morning. But, in essence, the President endorsed a modest civil defense program, emphasizing relocation and dual use so that whatever capability we were developing could have a peacetime application. There has yet to be a budget decision which will determine whether we, in fact, move forward with the program to develop relocation capability. That decision will be made and transmitted to the Congress this month.

I think, looking back over the past 2 years, we have made substantial progress. This committee's predecessor was very helpful and pointed out that, indeed, civil defense was a mess, organizationally as well as policywise and programwise, and I think that you showed us the light in early 1977 on a reorganization which has, in fact, come to pass, Reorganization Plan No. 3 of 1978, which abolishes my agency and several others, and consolidates their functions into a new agency, the Federal Emergency Management Agency.

The work that that agency will do will have value, dual value—both civil defense and application to peacetime disasters, both man-made and natural. Hopefully, we are moving in the right direction. I would hope that, with this committee's help and in the authorization and appropriations process this winter and spring, we will get a clear policy and program decision, and a direction which will resolve civil defense as an issue for the coming years.

The CHAIRMAN. Thank you very much, Mr. Tirana.

[The complete statement of Mr. Tirana follows:]

STATEMENT BY HON. BARDYL R. TIRANA, DIRECTOR, DEFENSE CIVIL PREPAREDNESS AGENCY

The Committee has asked that I testify on the current status of U.S. civil defense. The existing U.S. civil defense program is not effective.

Since the early 1960's, the program has concentrated on sheltering the population in-place, in best-available protection in existing structures, at or near homes, schools and places of work. Existing buildings have been surveyed to identify such protection, and in the early 1960's food, water containers, sanitation kits, and other austere survival supplies were procured to be stocked in shelter areas identified in larger buildings. Local plans ("community shelter plans") were developed for use by citizens of best-available shelters, and improvement of a number of supporting operational systems and capabilities was begun. These included Direction and Control, Warning, Radiological Defense, Emergency Public Information, and training and exercising.

Most of the capabilities for in-place protection developed through the 1960's have deteriorated significantly. Shelter stocks have far exceeded their intended shelf-life and have deteriorated, and many have been removed from shelters. Other systems and capabilities have been held to a maintenance level or less for a decade.

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The net result is that current U.S. civil defense capabilities for in-place protection are not highly effective. DOD studies suggest that should a large-scale attack occur after a crisis period of about a week or two, the current system might result in adding on the order of 10 million survivors, to a basic U.S. survival without any program of some 80 million.

It would take at least a year of intensive effort and large expenditures, during a period of heightened international tension, to bring the current in-place protection system to full effectiveness, by improving or rebuilding Direction and Control, Radiological Defense, and other needed systems and capabilities. In that case survival might total some 110 million in a large-scale attack.

DCPA was directed to begin work with the States, starting in FY 1976, to add an additional option with greater potential for population protection, namely, plans for crisis relocation of the population of potential U.S. risk areas. This effort has been pursued at a modest level (utilizing about 140 State-level planners), and to date initial local plans for the contingency of crisis relocation have been developed covering some 10 percent of the U.S. risk population.

Thus, there is not at present an effective U.S. capability for population relocation during a crisis. At the current level of effort, it would take at least a decade to complete relocation plans. More important, the current program can not provide for the supporting systems and capabilities that are essential for crisis relocation to achieve its full potential for lifesaving.

The Committee has asked whether passive defenses for the survival of the population would be feasible. A high-performance system based on construction of blast shelters in cities and fallout protection elsewhere would be technically feasible, but would be expensive, involving costs on the order of $60 billion. Such an approach is not economically or politically acceptable in the U.S., although a number of countries have been constructing blast shelters over a period of years.

The feasibility of protecting the U.S. population thus turns on the feasibility of relocating over 100 million people from potential risk areas during an intense international crisis. Please note that crisis (or strategic) relocation is based on movement over a period of several days—not rapid evacuation in a matter of hours as was contemplated 20 years ago, in the era of the manned bomber.

Reasonably effective crisis relocation can result in about the same level of survival as that provided by a far more expensive blast shelter system. However, there are obviously uncertainties involved. For example, would the direction to relocate be issued in time? Would the response of the population be predominantly cooperative and constructive? Would local and State officials, throughout the country, be effective in assisting the population to move to host areas, in providing temporary lodging and feeding, and in developing fallout protection in host areas?

There can be no complete certainty as to these and related issues, and opinions vary. At one extreme, some maintain that crisis relocation—and traffic control in particular—would be extremely difficult if not impossible, especially in densely urbanized areas such as the Northeast. A smaller group maintains, to the contrary, that the U.S. now has a crisis relocation capability by virtue of its extensive resources of autos, roads, and other transportation—and that no special plans or preparations are needed, as shown by the fact that so many people from our largest metropolitan areas go to the beach over long weekends in the summer. We believe that neither extreme view is valid.

It is DCPA's judgment, based on extensive research and developmental work, that crisis relocation could be highly effective—given the requisite planning and development of supporting systems and capabilities, and given about a week for moving and protecting the bulk of our population at risk. For example, while no one can issue a guarantee that the response of the population would be predominantly cooperative and constructive, experience in peacetime disasters and wartime situations requiring evacuation is that most people will comply with official instructions, provided these are understandable and appear to make sense in terms of improving chances for survival. Also planning includes provision for temporary lodging and feeding for evacuees, and for developing fallout protection in host areas. It is important to note that relocation has great lifesaving potential even if it works not perfectly but quite well.

It is significant that on September 1–3, 1939 the British moved some 1.5 million women and children from London and a few other large cities in what was a crisis evacuation, for Britain did not declare war until September 3. (Also of

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interest are the facts that some 2 million additional persons spontaneously evacuated at their own initiative, and that this was unsuspected at the time by the British government.) It is also worthy of note that in Hurricane Carla, in 1961, between half and three-quarters of a million people were evacuated from Gulf Coast cities without a single fatality or a major reported accident.

We believe that both the Constitution and the applicable legislation (the Federal Civil Defense Act of 1950, as amended) plainly require that the Federal Government make provision to protect the U.S. population in the event that deterrence and escalation control might ever fail. Crisis relocation, with a hedge for in-place fallout protection, is the only method of providing population protection at moderate cost. The State and local authorities we have so far invited to participate in crisis relocation planning have agreed it makes sense. Planning is underway in all States, and initial plans have been developed for some 80 smaller risk areas and for over 300 host counties. The view of State and local officials is that they would rather have the plan and not need it, than need the plan and not have it. The views of the public are similar.

We believe there are a number of compelling factors arguing for civil defense in general, and for preparations for crisis relocation in particular. The first is that the American people will know that their government is taking reasonable steps for the protection should deterrence ever fail, and that the defense of the United States includes more than the maintenance of military forces,vital though our deterrent forces are.

A second factor is that an extremely severe crisis could result in extensive spontaneous evacuation by residents of our larger cities. Capabilities developed for a directed evacuation would obviously be helpful to State and local governments in assisting spontaneous evacuees. Recent history provides a number of examples of such evacuation. One was the spontaneous departure of 2 million British urban residents in 1939, already mentioned. Another was the departure of many Parisians before the Wehrmacht's arrival in 1940, and a third was the virtually complete evacuation of East Prussia in the winter of 1944–45, ahead of the advancing Soviet forces. We have also had reports that many tourists cut short their vacations and left Florida during the Cuban missile crisis in 1962. It is thus reasonable to expect that an unprecedentedly severe crisis could result in extensive spontaneous evacuation of U.S. cities. Also, scenarios postulated by defense analysts sometimes include "demonstration attacks" on one or several targets. Should anything like this ever in fact occur, spontaneous evacuation would undoubtedly increase sharply.

A third consideration is that the United States should have an option for relocating its population should the USSR ever begin evacuating its cities. The existence of such a U.S. capability could contribute to its never having to be used. However, if both sides did in fact evacuate their cities, this could introduce a pause, and enhance chances for peaceful resolution of the crisis. Either of these considerations could justify, many times over, the effort required to develop crisis relocation plans and capabilities.

Should deterrence nonetheless fail, reasonably successful crisis relocation could result in scores of millions of added survivors.

Finally, the value of civil defense and crisis relocation is not limited to attack disasters or international crises. Population relocation is essential in case of flood, hurricane, or accidents involving toxic or radioactive materials—and could be required in the future should a terrorist threat be made against a U.S. city. In such a case, the plans made to relocate people to host areas in case of an international crisis, and to care for them there, could be executed for the city subject to the terrorist threat rather than for all cities. The new Federal Emergency Management Agency, soon to come into existence, will of course stress full-spectrum preparedness, as urged by the Joint Committee on Defense Production two years ago.

In closing, I wish to stress that while crisis relocation is a moderate-cost approach to population protection, with large lifesaving potential, it requires much more than paper plans alone. The plans, as they are developed, must be exercised with the State and local officials who would be responsible to carry them out (but exercises should not involve the public at large). Supporting operational systems must also be developed, such as Direction and Control, Communications, Warning, Radiological Defense, and Emergency Public Information. Current DCPA analyses suggest that "paper plans only" for relocation, without such supporting systems and preparations, would result in about half the total

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survival potential of a full system—about 40 percent survival in a heavy, mid-1980's attack, rather than the 80 percent survival potential of a full crisis relocation system.

The CHAIRMAN. Dr. Drell, go ahead, please.

STATEMENT OF SIDNEY DRELL, DEPUTY DIRECTOR AND EXECUTIVE HEAD, THEORETICAL PHYSICS, STANFORD LINEAR ACCELERATOR CENTER, STANFORD UNIVERSITY

Dr. DRELL. The subject of civil defense is important because it touches the basic human instinct of survival. Can anyone responsibly advocate that we and our society should ignore the ever-present potential of disaster, that we should make no plans and preparations for survival and recovery in the event of a nuclear attack or accident, or even for natural disasters?

At issue is not whether to do something. At issue is what we should be doing which could make a realistic contribution to avoiding nuclear war and to recovery should deterrence fail and nuclear war occur. Civil defense has entered into national security debates for 20 years. Civil defense activities have shifted between high and low intensity, blast and fallout shelters, from inplace shelters to population relocation, and from preparing for nuclear attack to preparing for civil disasters.

These changes are indicative of the fact that each new administration has felt the need to do something. However, through further analysis and reflection, the country has found no feasible alternative to just going on pretty much with the same low-priority level of effort, justified by concerns about recovery from both nuclear attack and civil disaster.

The most recent congressional debate on civil defense was initiated 3 years ago, when then Secretary of Defense James Schlesinger advocated a major change and revitalization of civil defense as an adjunct of a flexible-response doctrine that included options for limited counterforce against hard targets such as fixed ICBM's in their underground silos. Also, preparedness for nuclear attack was given exclusive priority relative to the mission of preparedness for peacetime emergencies. This limited-counterforce doctrine relied on civil defense to save lives and to assure very low casualty levels in the event of limited nuclear counterforce strikes.

However, the ensuing congressional debate and studies showed that the low casualty figures that initially motivated this new strategic doctrine, according to the Defense Department presentations, were, in fact, grossly misleading. With this revelation, civil defense returned once again to its low-priority status.

Now we seem to be witnessing yet another twist in civil defense policy. We have heard in the past few months from the Carter administration about its expressed intention to augment and revitalize it by a budget increase that at times has been reported to be a $50 million increase for the coming budget year or a 50-percent increase. The administration's reported plan emphasizes crisis relocation of the urban population, and yet another reorganization of civil defense is proposed, this time pulling civil defense back out of the Pentagon and re-

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unifying the planning for nuclear attack, once again with civil-disaster planning in a new Federal Emergency Management Agency.

Until the overall scale and scope of these new plans are revealed, we can only speculate about their implications for the future.

A $50 million add-on in fiscal year 1980, by itself, won't accomplish very much. It is barely enough to buy a road map for each one of the evacuees. It has been estimated that a 5-year investment cost of roughly $2 billion, plus some $200 million annual operating costs, are required to develop the components of a nationwide population-relocation organization and plan designed to be implemented in a surge period, extending at least 1 week during a crisis buildup.

As the Congress and the Nation receive, analyze, and debate any new civil-defense proposal by the Carter administration, we must address two vital questions, it seems to me: The first is, what impact will it have on the national security of the United States? In particular, does the new emphasis on civil defense signify a fundamental revision of the strategic policy of the United States? And second, what realistic estimates can be made of the effectiveness and life-saving potential of civil defense in the event of nuclear attack?

Concerning the impact of the civil-defense program on our national security:

The U.S. national-security policy recognizes that it is physically impossible to defend our vital national interests against a major nuclear attack. We have, therefore, heavily emphasized negotiations aimed at reducing the likelihood of military confrontation and have based our national security on a policy of deterrence of nuclear attack.

Fundamental to deterrence is the requirement of an assured-destruction capability to devastate any nation which has initiated nuclear attack against us. In addition, we have designed our weapons programs and deployments to meet the requirements of flexible response—that is, the capacity to respond in measure according to the provocation—and the requirement of strategic stability. Central among the requirements for stability of our forces is the existence of strategic forces that cannot be destroyed by preemptive attack—that is, they should be survivable.

Within this context of a policy of deterrence and stability, analysis shows that civil defense plays a relatively minor role. This was well documented by the recent U.S. Arms Control and Disarmament Agency's study which Mr. Keeny has just reported to you, which has considered various civil defense postures.

I have summarized numbers that I thought most relevant in table 1 of my testimony, and have displayed them on the board. (See table 1, p. 67.) In all cases, one is considering a U.S. response to a Soviet preemptive attack, and these casualty figures are based on the assumption that most of the U.S. ICBM's, or the Minutemen force, has been lost in this preemptive Soviet strike.

The retaliatory attack is delivered by the SLBM's, the submarines, and by the bombers. Even if these forces were on normal alert—so that only the normal number of bombers on strip alert and submarines out of port were available to deliver the retaliatory strike—there would be enough megatonnage to destroy more than 600 of the largest

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Soviet cities, and wipe out 65 to 70 percent of the industrial base as Mr. Keeny has reported.

In fact, however, 80 percent of all Soviet cities or towns with populations of 25,000 or more would have been attacked by at least one nuclear weapon.

Furthermore, even if the urban population is assumed to utilize fully the best available inplace sheltering capacity, the analysis shows that 60 million or more people would die due to prompt and near-term fallout effects alone. This is with the normal alert status of the forces.

If the Soviets were to initiate a nationwide evacuation out of the cities, the natural and prudent reaction by the United States would be to put our forces on full alert, so that a very high percentage of our SLBM's and bombers would survive the Soviet's preemptive strike—that is, most of the submarines would be out of port, and bombers on alert to take off.

The casualty figures in this case show that the predictable effectiveness of civil defense in the context of assured destruction is very limited. You notice from the table that the casualty figures, as also stated prior to this testimony, with full urban evacuation, are 20 to 35 million fatalities.

If, in addition, the reserve portion of our force were retargeted to attack people, the casualty levels would go up to the 70 to 80 million level, back up again to the level where they started without civil defense, which shows that the attacker, not the civil defense system, controls the casualty level.

The CHAIRMAN. What do you mean by "generated" and "nongenerated"?

Dr. DRELL. What I mean by "nongenerated" is that portion of the SLBM force that is normally out of port, and the SAC bomber force normally on strip alert. Roughly, I mean one-half of the submarine force and one-third of the bomber force.

What I mean by "generated" is that our forces are on full alert status in crisis, such as would be the case, I would presume, if we were to observe the Soviets evacuating their cities. In that event, essentially—well, a very high percentage of both our submarine forces and of our bomber forces would not be sitting at home to be hit by a Soviet preemptive first strike.

In all cases, the Minutemen missiles are assumed to be lost, however. This is just a set of assumptions to show the kinds of factors that are important in considering civil defense. You get a very different picture of the life-saving potential of civil defense if you consider it for a predetermined attack and ignore the response of a country observing a nationwide urban evacuation which takes 3 to 7 days, and thereby alerting its forces.

There is even the possibility, beyond what I'm speaking of, that Mr. Warnke mentioned this morning—namely, of launching on warning, if one saw the Soviets marching out of their cities. I have not included that possibility which would lead to still higher fatality numbers. It is on the basis of such considerations that I say that civil defense plays only a minor role in contributing to deterrence in the context of assured destruction.

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However, just as one cannot claim that civil defense will save a great many lives under all circumstances, one also cannot claim that it will not save substantial numbers of lives under some. Therefore, it would not be prudent to ignore or abandon civil defense and its life-saving and recovery possibilities. We should not, however, be deluded into thinking that civil defense would effectively alter the strategic balance.

The case for civil defense as a vital component of limited nuclear war strategy depends upon the very speculative and dangerous assumption that a limited nuclear exchange would remain limited and confined only to military targets without escalating into an all-out exchange.

However unlikely, such a possibility is not altogether unthinkable. In the event of such a limited counterforce strike, a moderate civil defense program could save lives and help with postnuclear attack recovery.

It is generally agreed that it makes good sense, both in terms of the life-saving potential and cost-effectiveness, to emphasize developing the plans and organization for population relocation during a crisis.

I also believe that it makes good sense for this planning to be meshed together with civilian disaster recovery, and I endorse this reorganization under the Federal Emergency Management Agency.

If the administration's plans are companion to a reorientation in our nuclear strategy toward greater emphasis on limited nuclear war fighting, they should be rejected along with such a change in policy as harmful to strategic stability, potentially provocative, and therefore counter to our national security interests.

If the administration's proposal is only contingency planning, then the public statements and arguments justifying it, as well as its basic content, should make this explicitly and unambiguously clear. Its support should not be based on the illusion that it makes nuclear war more credible, survivable, or winnable.

It is reason enough to view civil defense as a prudent and limited investment in one's contingency planning, whether against nuclear attack or civil defense for civil disasters.

Briefly, just three final points:

Is there a civil defense gap? One hears this frequently as an argument for civil defense. We have seen, by these numbers—and one can see in more detail from the analyses of both the CIA and the ACDA—that such an allegation of an effective civil defense gap is not in fact supported by further analysis and can only be based upon hollow perceptions.

Soviet civil defense preparations and protections of people can be very largely offset by placing U.S. forces at a high level of readiness and retargeting. Nor can one base this allegation of a civil defense gap on grounds of Soviets hardening or dispersing their key industrial capacity. This also is documented in the ACDA and CIA studies that Mr. Keeny referred to.

Let me just quote the Director of the Central Intelligence Agency in his report: "Soviet measures to protect the economy could not prevent massive industrial damage. The Soviet program for dispersal of

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industry appears to be offset by a contrary tendency for investments in new facilities to be inside or near a previously existing installation."

In other words, they are modernizing; they are not dispersing. I think this is hard evidence against the charge, or the allegation, by Mr. Huntington this morning that the Soviet Union is engaged in a damage limiting program.

How about civil defense as a crisis-management tool? This argument I do not find persuasive because nationwide evacuation of people from cities would be a highly cumbersome and disruptive step to take, causing tremendous economic upheaval.

It should be executed only in the ultimate extreme circumstances. It probably couldn't be done more than once, in fact. For an effective, flexible, and repeatable crisis measure, we can readily raise the alert status of our military forces.

As to realistic estimates being placed on the effectiveness of civil defense, we have not even touched the uncalculable components of nuclear war recovery. We have talked only about the easy factors, the physical parameters about which there is indeed no disagreement among those who have analyzed civil defense.

A confident estimate of the effectiveness of a nationwide civil defense system can never be given by either country because of the enormousness of the unknown. What are the prevailing winds? How much warning is available? How will the population behave during the evacuation and in the crowded shelters for months at a time after the attack?

Beyond the immediate fatalities, there are the long-term injuries and the environmental and ecological effects which cannot even be calculated to set the scale of the disaster.

In summary, then, Mr. Chairman, civil defense should not be viewed as substantially increasing the likelihood of survival or of recovery in a major nuclear war.

Retargeting by the attacker can offset most of the lifesaving potential. With or without civil defense, the urban industrial base will be destroyed in a major attack.

Two, a civil defense program that is part of a reorientation in our nuclear strategy toward greater emphasis on limited nuclear war fighting should be rejected along with such change in policy as harmful to strategic stability and potentially provocative and, therefore counter to our national security interests.

Civil defense should not be used to create and support the dangerous illusion that there is a likelihood of waging and surviving a nuclear war that is limited and confined to military targets only.

Three, a massive, nationwide relocation of the urban population is not an effective crisis-management tool.

Four, there are very great uncertainties in any estimate of the effectiveness of civil defense, no matter how detailed the calculations. Civil defense does not offer a realistic escape from the current nuclear balance of terror. This is a message I think we should broadcast, rather than hide.

Five, I favor the proposed reorganization into the Federal Emergency Management Agency that will be responsible for joint planning for both nuclear attack and for civil disasters. However, a clear and substantive statement by the administration of the goals, extent, and

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ultimate cost of the newly proposed plans should precede action on the new funding request.

Finally, what is important is the maintenance of highly survivable strategic forces and progress in the negotiations at SALT, which are both of great importance to our national security.

In view of the terrifying scale of destruction of our arsenals, I believe that the challenge to control nuclear weapons and to avert nuclear war is the problem of overriding importance facing our generation.

If nuclear war were ever to occur, civil defense could do little to improve our prospects of survival, much less of victory. Thank you.

The CHAIRMAN. Thank you very much, Dr. Drell.

[Complete statement of Dr. Drell follows:]

TESTIMONY ON THE EFFECTIVENESS OF CIVIL DEFENSE AND ITS ROLE IN THE U.S.-SOVIET STRATEGIC BALANCE

(By Sidney D. Drell)

INTRODUCTION

Thank you very much for the opportunity to appear today before this Committee and participate in these very important hearings on the effectiveness of civil defense and its role in the U.S.-Soviet strategic balance. I speak as an individual. I am a physicist with a background of 19 years of work on national security programs of the United States as a consultant to various offices and departments of the U.S. Government.

The subject of civil defense is important because it touches the basic human instinct of survival. Is there anyone among us who can stand up and responsibly advocate that we and our society should ignore the ever-present potential of disaster; that we should make no plans and preparations for survival and recovery in the event of a nuclear attack or accident, or even for natural disasters?

At issue is not whether to do something. At issue is what we should be doing which could make a realistic contribution to avoiding nuclear war and to recovery should deterrence fail and nuclear war occur.

Civil defense has entered with episodic prominence into our national security debates for more than 20 years. In no other national security issue have there been sharper reversals or more confusing contradictions than in our civil defense policy. Our civil defense activities have shifted between low and high intensity and the focus of civil defense has shifted from blast to fall-out shelters, from community to individual back-yard shelters, from in-place shelters to population relocation or evacuation planning, and from preparing for nuclear attack to preparing for civil disasters. These changes are indicative of the fact that each new administration, and even new leaders within the same administration, have felt a need to do something. However, after further analysis and mature reflection, the country has found no feasible alternative to just going on pretty much with the same low priority level of effort, justified by concerns about recovery from both nuclear attack and civil disaster.

RECENT HISTORY OF CIVIL DEFENSE

Following the Berlin crisis in 1961 President Kennedy initiated an extensive and accelerated nationwide fall-out shelter program under Defense Department auspices. In assigning civil defense as a Secretary of Defense responsibility he separated it from peacetime disaster relief functions which were assigned to the cognizant government departments and coordinated in the Office of Emergency Preparedness in the Executive Office of the President.

However, just as abruptly as it was created, two years later this civil defense plan was reduced drastically in scope. Indeed the shelter program didn't progress very much beyond the surveying, marking, and stocking of shelters in existing structures to the construction of new shelters—either in large buildings or of the back-year variety. Two reasons were responsible for this at that time:

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1. It was argued that our civil defense posture should develop hand-in-hand with the strategic force structure and policy. But commencing with 1963 the U.S. abandoned as both futile and potentially provocative a strategy based on counterforce, city-avoiding attacks. We opted instead for assured destruction, de-emphasizing passive defenses, or civil defense.

2. Further analysis showed that an effective shelter program against nuclear attack would be exceedingly expensive and disruptive of our society, requiring a high degree of civilian organization, participation, and regimentation in exercises.

This shelter-marking program continued with low priority and profile through the 1960's. It broadened in scope in 1971–72, but it did not increase its budget, to consider peacetime hazards as well as nuclear attacks and also dangers or disasters developing gradually as well as very rapidly. This dual purpose of civil defense planning involved local, state, and federal government cooperation and was emphasized by then Secretary of Defense Elliot Richardson in his Department of Defense Posture Statement for fiscal year 1974.

A third abrupt turn in the emphasis for civil defense, with an implication of future funding increases that has not in fact been implemented, was advocated the following year by the next Secretary of Defense, James Schlesinger, as an adjunct of a flexible response doctrine that included options for limited counterforce against hard targets such as fixed ICBM's in their underground silos. This doctrine justified civil defense as necessary to improve the credibility of our limited nuclear war posture by evacuating, relocating, and protecting the civilian population from the effects of limited Soviet nuclear attacks. Originally the Defense Department claimed [1] that with extensive civil defense available we "could reduce nationwide fatalities due to fallout from a limited Soviet counterforce attack to relatively low levels—well under 1 million." This led to the conclusion [2] that "the likelihood of limited nuclear attacks cannot be challenged on the assumption that massive civilian fatalities and injuries would result," and therefore we were obliged to prepare for such conflict. At about this same time, the realization of a continuing robust civil defense program by the Soviet Union led to claims of a developing civil defense gap vis-a-vis the United States. This "gap" provided the basis of warnings that the U.S. would face a crisis instability if we were not able to provide comparably effective survival protection to our population. As a consequence of the added emphasis given to civil defense and its reorientation as an adjunct of flexible response, preparedness for nuclear attack was given priority over preparedness for peacetime emergencies.

These proposed changes in national civil defense policy and strategic policy triggered extensive Congressional discussions during 1975–76 for the first time since 1963. In particular, members of the Senate Committee on Foreign Relations expressed great surprise at the low casualty figures in the Defense Department presentations and questioned the assumptions on which they were based. Subsequent detailed analyses by the Department of Defense and by the Congressional Office of Technology Assessment [3] in response to these questions showed those figures to be, in fact, grossly misleading. Furthermore, the existence of a civil defense "gap" between the U.S. and the Soviet Union was widely challenged on grounds of the lack of any evidence of the Soviet's achieving, or even showing any prospects of achieving, an effective defense of either their population or industrial base against a massive nuclear attack.

The new rationale for civil defense provoked some intense public debate during 1975–76, but it had not yet impacted on the spending for civil defense when the Carter Administration came to office just two years ago. At the outset it appeared as though civil defense would remain quietly on the back burner. President Carter had expressed grave doubts about the concept of limited nuclear war during his campaign. Harold Brown, in an interview that appeared in the Los Angeles Times on December 26, 1976 shortly after he was designated to be Secretary of Defense commented that there was little reason to believe that the Soviet shelter program

[1] Annual Defense Department Report for Fiscal Year 1976, page II–55.
[2] Briefing by Secretary James R. Schlesinger on Counterforce Attacks, hearings held before the Senate Foreign Relations Committee, Subcommittee on Arms Control, International Law and Organization, Sept. 11, 1974. See also Analyses of Limited Nuclear Warfare prepared by the Congressional Office of Technology Assessment for the Senate Committee on Foreign Relations, Subcommittee on Arms Control, International Organizations and Security Agreements, Sept. 1975.
[3] In Analyses of Effects of Limited Nuclear Warfare (op cit)

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would in fact confer a significant advantage in the event of a nuclear war, adding "the way to counter a relatively ineffective system is not to replicate it on the other side."

THE NEW PROPOSAL FOR CIVIL DEFENSE

Now we seem to be witnessing yet another new twist in civil defense policy. Within the past two months the Carter Administration has expressed is intention to revitalize civil defense and to augment it by increasing its budget in fiscal year 1980 reportedly to $140M, up by about $50M or slightly more than 50 percent from FY–79. The Administration's plan emphasizes crisis relocation of the urban population. Yet another reorganization of civil defense is also proposed; this time pulling civil defense back out of the Pentagon and reunifying the planning for nuclear attack once again with civil disaster planning in a new Federal Emergency Management Agency.

Until the overall scale and scope of these new plans are revealed we can only speculate about their implications for the future. A $50M add-on for fiscal year 1980 won't by itself accomplish very much; it would barely suffice to buy a road map for each evacuee! Evidently this sum is no more than the first installment of a more substantial expenditure. At the other extreme, there is no evidence to suggest that these new plans are the start of a national multi-billion dollar effort to match the Soviet investment in civil defense. A possible scale of plans and spending is suggested by a recent study on "Candidate U.S. Civil Defense Programs" which was prepared for the Defense Civil Preparedness Agency by the Systems Planning Corporation.[4] Their analysis estimated that a five-year investment cost of roughly $2 billion plus some $200M annual operating costs are required to develop the components of a credible nationwide population relocation organization and plan that could be implemented in a surge period extending at least one week during a crisis build up. The envisaged actions during the surge period would include evacuating some 110 million people, or 80 percent of the population, from the metropolitan and other risk areas around the country; reconfiguring the normal peacetime wholesale/retail food distribution patterns in the rural host areas; upgrading the available fall-out protection for the evacuees; providing some in-place sheltering as a hedge in the event that a full evacuation is impossible; training some 600,000 shelter managers; and stocking the shelters with basic supplies which for reasons of economy would not be provided in peacetime.

As the Congress and the nation receive, analyze, and debate the new civil defense proposal of the Carter Administration we must address two vital questions:

1. What impact will it have on the national security of the U.S.? In particular, does the new emphasis on civil defense signify a fundamental revision of the strategic policy of the United States?
2. What realistic estimates can be made of the effectiveness and life-saving potential of civil defense in the event of nuclear attack?

Prior answers to these questions are required for guiding any new commitment to upgrade civil defenses. They surely are not less important than the maps and plans that are to be provided for guiding population evacuation.

THE IMPACT OF EXPANDED CIVIL DEFENSE PROGRAMS ON U.S. NATIONAL SECURITY

The United States national security policy recognizes that it is physically impossible to defend our vital national interests against a major nuclear attack. We have, therefore, given a heavy policy emphasis to international negotiations aimed at reducing the likelihood of military confrontation and have based our national security on a policy of deterrence of nuclear attack. Fundamental to deterrence is the requirement of having an assured destruction capability to devastate any nation which has initiated nuclear attack against us. In addition we have designed our weapons programs and deployments to meet the requirements of flexible response—that is the capacity to respond in measure according to the provocation—and of strategic stability. Central among the requirements for stability is the existence of strategic forces that cannot be destroyed by preemptive attack; that is they should be survivable. This criterion lies at the heart of much of the current national security debate within this country with

[4] Technical Report 342 (March 1978) prepared by Roger J. Sullivan, Winder M. Heller, E. C. Aldridge, Jr.

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particular reference to SALT II. There is, quite properly, a serious concern about whether our Minutemen ICBM's will be vulnerable to a preemptive strike in the 1980's due to improved accuracy of the Soviet strategic missiles and extensive ICBM MIRVing on their part. This is, in my judgment, a serious issue to which the U.S. should respond, and is responding, with its military programs. The provisions of the draft treaty at SALT II have been designed to be compatible with such programs. However, within the context of a policy of deterrence and stability, civil defense plays a relatively minor role.

Additional missions beyond deterrence based on assured destruction have on occasion been proposed for our strategic forces. These missions range from political or military coercion to limited nuclear war fighting and "winning" (whatever that means if you don't survive). It is in the context of limited nuclear war fighting scenarios that civil defense is frequently viewed as having an enhanced importance. In this connection recall the 1975 Defense Department claims of low casualty levels to a sheltered population in a limited nuclear counterforce attack that I referred to and criticized earlier. The important and immediate question raised by the renewed emphasis on civil defense proposed by the Carter Administration is whether or not this is a part of a reorientation of our national security policy toward a greater emphasis on limited war fighting as opposed to deterrence based on assured destruction.

The ability to target and strike an opponent's nuclear forces—the strategic missiles and bombers plus the command and control centers—is a central requirement in a limited nuclear war fighting posture. This requirement, however, conflicts directly with a central criterion for strategic stability which applies to both the U.S. and the Soviet Union—i.e., the existence of survivable strategic forces. It is here that a choice must be made. You can't have it both ways. Either we emphasize survivable forces and strategic stability in our planning or we give priority to a limited nuclear war fighting and winning strategy built around a hard target counterforce capability. Either we give priority to deterring a nuclear catastrophe by emphasizing strategic stability or we give priority instead to "winning" a nuclear conflict. A choice between these two essentially different possibilities must be made by both the U.S. and the Soviet Union. This choice implies different weapons programs and deployments, as well as arms control positions.

I am not discussing here a choice of whether or not the U.S. should have flexible alternatives to massive retaliation. It has long been recognized in defining the requirements of deterrence that nuclear weapons might be launched with less than maximum force by either side. This requirement of "flexible response" can be implemented by our present forces. With our extensive and recently modernized retargeting capabilities the President presently has many alternatives to the intentional and almost certainly suicidal massive retaliation against civilian populations. Flexible response, however, can create serious difficulties for stable deterrence if it is extended too broadly to include extensive hard-target counterforce, and when the deployed forces are technically capable of implementing it.[5]

Nor am I discussing here the relatively straightforward issue of maintaining a capacity for assured destruction. That will be assured for the foreseeable future by our Poseidon/Trident SLBM force moving quietly and invisibly under the ocean's surface and by our ready alert SAC bomber force that can be launched and flown out, given the warning that we can expect of an actual attack. In fact the megatonnage on just one-tenth of these two alert and survivable components of our strategic forces could devastate the two hundred largest Soviet cities by delivering on the average some ten times as much effective megatonnage per city as done to Hiroshima and Nagasaki. Since more than 60% of the Soviet industrial base and more than 30% of their population, or 90 million people, are located in these 200 cities this is presumably a magnitude of vulnerability to destruction of considerable significance to the Soviet leaders.

For an extensive and detailed analysis of the impact of civil defense on the assured destruction capability of the U.S., I refer to a recently completed study by the U.S. Arms Control and Disarmament Agency.[6] The unclassified summary

[5] For further discussion of this point see testimony by Sidney D. Drell before the Senate Committee on Foreign Relations (January 19, 1977) [appearing in Hearings on United States/Soviet Strategic Options].

[6] ACDA Defense Study (1977–78).

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of this study, "An Analysis of Civil Defense in Nuclear War" was issued last month and presented to this Committee at these hearings. This study looks ahead to the mid-1980's, projecting the U.S. and Soviet strategic forces under the proposed SALT II agreement, and considers various civil defense postures as well. In all the cases analyzed in this study the U.S. is assumed to be retaliating after a Soviet first strike which destroyed most of its ICBM force as well as the submarines in port and the non-alert bombers. The U.S. retaliatory strike is thus assumed to be delivered mainly by the alert bomber force and the fraction of the SLBM's at sea. The size of this surviving SLBM/bomber force depends on whether the U.S. forces are on a normal day-to-day alert—i.e., non-generated—or are assumed to be fully generated—i.e., on full alert—as would presumably be the case during a period of crisis if, for example, the Soviet Union were to evacuate its cities. The megatonnage delivered in these strikes is computed on the basis of the currently projected mix of U.S. warheads, including Trident missiles and air-launched cruise missiles, for the mid-1980's. The U.S. retaliatory strike is assumed to be directed primarily against Soviet counter-force and other military targets as well as their key national production capacity. Except where explicitly stated otherwise, the U.S. is assumed to hold back from the retaliatory strike a reserve force of 10–15% of its surviving warheads. Analogous targetting assumptions are made in calculating U.S. fatalities caused by a Soviet strike.

LIFE-SAVING POTENTIAL OF CIVIL DEFENSE

The ACDA analysis concludes that such a retaliatory second strike by the surviving U.S. forces, assuming they were non-generated, would destroy more than 600 of the largest Soviet cities and wipe out 65-70 percent of their industrial base. In fact, however, 80 percent of all Soviet cities and towns with populations of 25,000 or more would be attacked by at least one nuclear weapon. Furthermore, even if the urban population is assumed to utilize fully the best available in-place shelter capacity, this analysis finds that there will be more than 60 million civilian fatalities due to prompt and near-term fall-out effects alone. Moreover, due to radioactive fall-out generated by those weapons burst at or near ground, a time interval of two months or longer would be required before workers could effectively start the task of rebuilding.

Were the Soviets to initiate a nationwide evacuation out of the cities the natural and prudent reaction by the U.S. would be to put our forces on a fully generated alert so that a very high percentage of our SLBM's and strategic bombers would survive a Soviet preemptive strike. The casualty figures in this case, as shown in Table I, reveal how limited is the predictable effectiveness of civil defense in the context of an assured destruction policy. Even if the Soviets are successful in completing the evacuation of 80 percent of the urban population, providing them with expedient sheltering in the countryside and with the remaining 20 percent receiving the best available in-place sheltering, the total number of Soviet fatalities would remain very high.

In particular, if the U.S. launches its reserve force of some 10–15 percent of the surviving warheads that were not included in the calculation above and targets them against the population, the Soviet fatality figures increase to 60 million. The fatalities would be even higher—in the range of 70–85 million—and the resulting industrial damage would be only slightly reduced if all the U.S. warheads were ground burst in order to generate maximum fall-out against the population.

It is clear from the ACDA results in Table I that one can draw similar conclusions about the effectiveness of civil defense for reducing U.S. casualties in the event of a major Soviet (third) strike in response to our retaliation.

A very different picture of the life-saving potential of civil defense is often painted by considering a pre-determined attack and comparing the casualty and fatality levels for a sheltered versus an unsheltered population or an evacuated versus an unevacuated urban population. However, conclusions from these comparisons can be very misleading. As we have seen, the predicted effectiveness of civil defense in saving lives is very sensitive to parameters controlled by the attacker. In particular, in response to a nationwide urban evacuation which would be observed over a period of at least several days, an opponent would presumably and rationally place his forces on a fully generated alert as well as retargetting some of them. This would largely neutralize any presumed life-saving potential of the evacuation.

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It is on the basis of such considerations, and the numbers in Table I, that I conclude that civil defense plays only a minor role in contributing to deterrence in the context of assured destruction. However, just as one cannot claim that civil defense will save a great many lives under all circumstances, one also cannot claim that it will not save substantial numbers of lives under some. Therefore it would not be prudent to ignore or abandon civil defense and its life-saving and recovery possibilities. On the other hand, we should also not be deluded into thinking that civil defense would effectively alter the strategic balance even if supported at the current Soviet level of activity which, in terms of the U.S. equivalent, is judged to cost roughly $2 billion annually.

Whatever the current geopolitical circumstances or recent historical experiences that lead the Soviet Union to continue its traditional emphasis on defense, it is apparent from our discussion that it has gained little if any strategic military value from its investment. I see no valid reason for the U.S. to imitate a comparable level of activity in civil defense. I fear that the net effect of our initiating such a massive effort would be to escalate the U.S.-Soviet arms competition and tension. This competition would be intensified by the same arguments that lead some U.S. observers to view the continuing robust Soviet civil defense effort with alarm, in spite of its limited projected effectiveness; in spite of the fact that the Soviets have never tested their system with a large-scale city evacuation; and in spite of the fact that there is evidence that this program has experienced bureaucratic difficulties and apathy on the part of a large segment of the population.[7]

CIVIL DEFENSE IN LIMITED WAR

The case for civil defense as a vital component of a limited nuclear war fighting strategy depends on the very speculative and dangerous assumption that a limited nuclear exchange would remain limited and confined to military targets only without escalating to an all-out exchange. Nonetheless a limited nuclear counterforce strike is a possibility which is not altogether unthinkable.

There will always exist some lucrative and inviting counterforce targets, no matter how much we emphasize the importance to strategic stability of deploying and maintaining secure and invulnerable strategic forces. Some fixed land-based ICBM's will presumably be retained for quite some time in the strategic forces of the U.S. and the Soviet Union in spite of their growing vulnerability to preemptive attack. I say this because of their robust and flexible command and control features and because of the enormous investment in ICBM's, particularly by the Soviet Union which has concentrated more than 75 percent of its nuclear punch in its ICBM's. Additional counterforce targets include the naval bases providing berthing and support for the SLBM's and the air bases for the strategic bomber forces. There also exist redundant components of the command, control, communication, and intelligence infrasturcture for these forces in hardened shelters; and there are, of course, many "other military targets" from supply depots and staging areas to transportation choke-points and military installations.

In the event of a limited counterforce strike a moderate civil defense program could save lives and help with post-nuclear attack recovery. It is generally agreed that it makes good sense, both in terms of the life-saving potential and cost effectiveness, to emphasize developing the plans and organization for population relocation during a crisis surge period. I also believe that it makes good sense for this planning to be meshed together with civilian disaster recovery. Such coordinated planning should command greater public interest and hence be more effective. On this score I strongly endorse the Administration proposal to reunify the crisis relocation planning for nuclear attack with civil disaster planning in a new Federal Emergncy Management Agency. Before endorsing any specific budget request, however, we should know much more about what the plans of the Administration actually are. What is the ultimate goal and extent of this revitalized civil defense programs? Is it only contingency planning or is it just the first step of a much more ambitious program associated with a revision of strategic policy oriented more toward nuclear war fighting?

If it is only contingency planning, then the public statements and arguments justifying the proposal as well as its basic contents should make this explicitly

[7] This assessment is also given by the Director of Central Intelligence in the unclassified summary of the CIA analysis "Soviet Civil Defense" (NI 78–10003, July 1978).

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and unambiguously clear. Its support should not be built on a delusion that it makes nuclear war more credible because we are more likely to limit it, survive it, or win it. It is reason enough to view civil defense as a prudent and limited investment in one's contingency planning—whether against nuclear attack or civil disasters.

If, however, the Administration's civil defense plans are companion to a reorientation in our nuclear strategy toward greater emphasis on limited nuclear war fighting, they should be rejected along with such a change in policy as harmful to strategic stability, potentially- provocative, and therefore counter to our national security interests. The argument for putting severe limitations on such preparations was stated clearly and persuasively in 1975 by the present Secretary of Defense, Harold Brown:[8]

"I am convinced that by far the least probable outcome is a nuclear exchange confined in any effective way to military targets. Providing that no one is deceived into thinking that the existence of forces, options and plans for a strategic counter-military exchange makes survival of either the United States or the Soviet Union in a nuclear war at all likely, or into forgetting that the fatal and almost certain outcome is the explosion on the cities of both countries of nuclear weapons, the existence of such plans and the development of such forces is an acceptable idea. However, to the extent that it erodes deterrence, this contingency planning could increase the likelihood of catastrophe. For that reason, it ought to be severely limited."

IS THERE A CIVIL DEFENSE GAP?

There are two arguments that one frequently hears in support of civil defense which I do not find at all persuasive. The first is that there is a civil defense gap between the U.S. and the Soviet Union which threatens the credibility, if not the very existence, of the U.S. deterrent. In view of this, it is argued, we must build up our civil defenses to narrow the gap. Such an allegation is in fact not supported by further analysis. A Soviet effort to reduce casualties by fully and successfully implementing their civil defense preparations and protection can be largely offset by placing the U.S. forces at a high level of readiness. In this event many more SLBM and bomber warheads would survive the presumed Soviet first strike and be available for retaliation. The fatality estimates shown in Table I would be even higher if an attack was targeted primarily against the population instead of primarily against military and industrial targets or if the attack occurred against an evacuation that was still in progress or only partially successful. There is currently no evidence to lead one to conclude that the Soviets would effectively implement a nationwide crisis evacuation. In particular, the Soviet Union has never tested a large scale city evacuation, and there is no evidence that the Soviets can successfully execute nationwide crisis relocation. What the Soviets are known to have done is to build shelters for part of the work force and leadership and to have created a program for training of civil defense workers. Analysis of the Soviet population distribution and of the proximity of their population with industry shows that their urban density is greater than the U.S.; their rural density and industrial concentration is similar to ours; and their population colocation with industry is greater. On these grounds they clearly have no inherent advantage over the United States.

Nor can one base an allegation that there exists a civil defense gap on grounds of Soviet hardening or dispersal of their key industrial capacity. Although we are familiar with published plans for protecting their industry there is little evidence of industrial dispersal or hardening by the Soviet Union. This perhaps reflects the very great cost of such measures as well as Soviet realization of their limited effectiveness; in particular, even buried facilities—if targeted—cannot survive.

The ACDA analysis of civil defense in nuclear war considered industrial damage as well as fatalities. Industrial facilities were assumed to be destroyed if they were subjected to overpressures of 10 psi (pounds per square inch) or more ,which is equivalent to a wind blast of 600 miles per hour or more. This is an

[8] Harold Brown, speech before Institute of U.S. and Canadian Studies of the Soviet Academy of Sciences in Moscow (March 1975) : submitted for the record on Hearings on Civil Preparedness and Limited Nuclear War held before the Joint Committee on Defense Production, April 28, 1976, page 130.

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offense-conservative standard of damage when compared with pictures of the mangled wreckage of the machine shop at the Mitsubichi Steel and Arms Plant in Nagasaki that was subjected to a 6 psi overpressure.[9] A summary of the ACDA findings is that the representative U.S. retaliatory strikes caused:

(*a*) 65 to 70 percent destruction of key Soviet production capacity from U.S. forces in normal day-to-day alert status;

(*b*) 85 to 90 percent destruction of key Soviet production capacity from a generated U.S. force status;

(*c*) 60 percent collateral damage to non-targeted Soviet production capacity from normal alert; and

(*d*) 80 percent collateral damage to non-targeted Soviet production capacity from generated alert.

As also noted in the ACDA analysis, any attempt to harden above-ground industrial facilities could be easily overcome by detonating weapons at lower altitudes near ground with only a minor reduction in the area subjected to 10 psi overpressures.

A similar conclusion is found in the analysis of Soviet Civil Defense issued by the Director of Central Intelligence:[10]

"Soviet measures to protect the economy could not prevent massive industrial damage. The Soviet program for dispersal of industry appears to be offset by a contrary tendency for investments in new facilities to be inside or near previously existing installations."

These conclusions fully support those stated in the Report on Industrial Defense and Nuclear Attack which is Part II of the Civil Preparedness Review issued in April 1977 by the Joint Committee on Defense Production of the U.S. Congress.

To summarize, an allegation that there exists an effective civil defense gap between the U.S. and the Soviet Union cannot be sustained either on grounds of life-saving potential or of industrial survival. In view of these findings as well as an appreciation of the many uncertainties attendant to a nuclear exchange, the CIA analysis of Soviet civil defense stated as a key finding: "We do not believe that the Soviets' present civil defenses would embolden them deliberately to expose the U.S.S.R. to a higher risk of nuclear attack." I concur.

CIVIL DEFENSE AS A CRISIS MANAGEMENT TOOL

A second argument that I do not find at all persuasive for implementing a crisis relocation civil defense plan is that it would serve as an effective crisis management tool. Crisis relocation of people on a large scale would cause a tremendous domestic and economic upheaval. Thus, it should be executed only in the ultimate extreme circumstances; probably it could be done no more than once. For an effective flexible and repeatable crisis measure we can readily raise the alert status of our military forces.

One possibility in the event of a crisis raising U.S. fears of an impending Soviet preemptive attack would be to evacuate only the population near our counterforce targets. This involves moving a relatively smaller number of people out of a high-risk area to join a larger number who are presumably at lower risk. A limited relocation of this type would be interpretable unambiguously as a defensive move and would be much easier to accomplish than a full-scale relocation of the massive population concentrations in the northeastern and California urban areas into a relatively sparsely populated countryside. Civil defense planning should include preparations for such a contingency. This would also help us understand the difficulties and practical limits in implementing a full-scale nationwide crisis relocation of the population.

WHAT REALISTIC ESTIMATES CAN BE PLACED ON THE EFFECTIVENESS OF CIVIL DEFENSE IN THE EVENT OF NUCLEAR ATTACK?

So far we have emphasized physical parameters and calculable components of civil defense. There are in addition very important aspects that cannot be predicted or calculated in an analysis of the effectiveness of civil defense because

[9] See the ACDA report; also pictures in "The Effects of Nuclear Weapons" (S. Glasstone, editor) published by the U.S. Atomic Energy Commission (Rev. Ed. 1964), see especially pages 220–221.

[10] Op cit.

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they depend on human behavior under unparalleled conditions of stress and devastation. Honest and reasonable men can disagree on how important these human factors will be in setting the scale of the disaster. It is clear however that estimates of fatalities that ignore such imponderable factors are at best highly fragile minimum levels of expected fatalities.

A confident estimate of the effectiveness of a nationwide civil defense system can never be given by either country, no matter how detailed the calculations and quantitative the claims, due to the enormity of the unknowns: What are the prevailing winds and weather patterns? How much prior warning is available? How will the population behave during the evacuation and in the crowded shelters during and after a nuclear attack for a period of time extending over several months, or long enough for the deadly radioactivity to decrease to tolerable levels?

Beyond the immediate fatalities there are the additional deaths, illnesses, and injuries from burns, fire, flying debris, exposure, radiation poisoning, panic, and the breakdown of law and order. Epidemic diseases such as cholera and typhoid are almost certain to break out due to the inadequate sanitation, inability to bury the dead, contamination and shortages of food, and the availability of only limited medical care and facilities within the crowded shelters (with at best only about one square meter of floor space per sheltered person) will be many of the roughly 30 to 50 million injured to be cared for.

For massive nuclear attacks the uncertainties are even greater in terms of the long-term ecological effects and the problems of reestablishing a society in the midst of devastation on an unparalleled scale. The study on Long-Term Worldwide Effects of Multiple Nuclear Weapons Detonations issued by the National Academy of Sciences in 1975 is revealing in its emphasis on just how extensive are the physical unknowns that will determine the scale of the disaster resulting from a major nuclear conflict and how little can be predicted with confidence concerning, for example, depletion of the ozone layer or disruption of the food supplies in the northern hemisphere as a result of a major U.S. Soviet nuclear conflict. In view of these large-scale environmental uncertainties and in view of the destruction of nationwide economic systems and the questionable continuity of governmental structures after such a conflict, there is little that can be said about long-term post-attack recovery prospects, with or without civil defense.

SUMMARY

Civil defense should not be viewed as substantially increasing the likelihood of survival or of recovery in a major nuclear war. Retargeting by the attacker can offset most of the life-saving potential of civil defense. With or without civil defense, the urban/industrial base—including most of the cities and key national production facilities—will be destroyed in a major atack.

A civil defense program that is part of a reorientation in our nuclear strategy toward greater emphasis on limited nuclear war fighting should be rejected along with such a change in policy as harmful to strategic stability, potentially provocative, and therefore counter to our national security interests. Civil defense should not be used to create and support the dangerous illusion that there is a likelihood of waging and surviving a nuclear war that is limited and confined to military targets only.

A massive nationwide relocation of the urban population is not an effective crisis management tool.

There are very great uncertainties in any estimate of the effectiveness of civil defense no matter how detailed the calculations. Civil defense does not offer a realistic escape from the current nuclear "balance of terror."

I strongly favor the proposed reorganization of civil defense into a new Federal Emergency Management Agency that will be responsible for joint planning for both nuclear atack and civil disasters. However, a clear and substantive statement by the Administration of the goals, extent, and ultimate cost of their newly proposed civil defense plans should precede action on their new funding request.

The maintenance of highly survivable strategic forces and progress in the negotiations at the Strategic Arms Limitation Talks (SALT) are both of great importance to the U.S. national security.

Current U.S. weapons are responding to the growing vulnerability of our Minuteman ICBM's due to improved accuracy of the Soviet strategic missiles and extensive ICBM MIRVing on their part. At the same time, we are making

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slow but steady negotiating progress at SALT. Based on what is known about the draft treaty at SALT II, I believe it is an important step which I strongly endorse in the interest of U.S. national security. Although its accomplishments fall short of my hopes and goals for real arms control, SALT II is important for a number of reasons. It establishes an agreed numerical measure of overall equivalence, incorporating minor but real numerical reductions, which can serve as a solid basis for continuing negotiations in SALT II and beyond for more substantial reductions and more significant agreements. It also puts some modest limits on force modernization. This beginning of qualitative limits on weapons is important because the pace of military technological progress when funded, as at present, with high budgetary priority is so fast that it has been outstripping diplomatic success and creating new obstacles to arms control progress. Now that we have formalized deterrence vis-a-vis the Soviet Union as a result of the ABM treaty of SALT I and are in the process (I hope) of formalizing overall equivalence in SALT II, I look to the next round of SALT for those measures of qualitative restraint that are required for maintaining strategic stability.

In view of the terrifying scale of destruction that the current strategic arsenals of the U.S. and the U.S.S.R. are capable of, I believe that the challenge to control nuclear weapons and to avert nuclear holocaust is the problem of overriding importance facing our generation. If nuclear war were ever to occur, civil defense could do little to improve our prospects of survival, much less of victory.

TABLE I.—NEAR-TERM FATALITIES FROM ATTACK ON COUNTERFORCE, OTHER MILITARY TARGETS, AND INDUSTRY

[In millions]

	U.S. fatalities		Soviet fatalities	
	Generated	Nongenerated	Generated	Nongenerated
No civil defense	NA	105–131	NA	81–94
Inplace protection, no evacuation	107–126	76–85	80–88	60–64
Inplace protection, with urban evacuation	69–91	NA	23–34	NA
Inplace protection, with urban evacuation (direct population attack)	87–109	NA	54–65	NA
Inplace protection, with urban evacuation (direct population attack) ground burst			70 85	NA

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Limited Nuclear War

The U.S. may be committing itself to preparing for a war limited to attacks on military bases, with relatively few civilian casualties. Would the casualties really be few, and could the war stay limited?

by Sidney D. Drell and Frank von Hippel

For more than a decade U.S. strategic policy has been dominated by the recognition and acceptance of a few simple facts: We and the Russians are each other's nuclear hostages; in the event of nuclear war neither this country nor the U.S.S.R. would be able to defend itself against virtual annihilation; even if one side were to initiate the war with a massive preemptive attack, the other would retain an "assured destruction" capability, the ability to devastate the attacker. In one form or another this recognition has underlain most of the past quarter century of mutual deterrence.

It has also been recognized, however, that nuclear weapons might be launched with restraint on both sides, with less than devastating results. President Nixon emphasized in 1970 the importance of having options other than "massive retaliation" for replying to a small (and possibly accidental) attack. That formulation of flexible response was nothing new. U.S. leaders have for many years had the option of launching a limited nuclear attack rather than an all-out one. The requirements of flexible response were expanded, however, by former Secretary of Defense James R. Schlesinger in Congressional testimony on March 4, 1974. According to his formulation, the U.S. should include in its flexible-response repertory the possibility of replying to a limited nuclear attack with selected strikes, notably "counterforce" strikes targeted against enemy military installations. Schlesinger argued that such strikes would be qualitatively different from intentional attacks on population centers, reducing the probability that a limited nuclear war would escalate into a massive exchange resulting in large civilian casualties, and that a flexible capability would make the possibility of a U.S. nuclear attack more credible and would thus increase the leverage provided by U.S. nuclear forces in international confrontations.

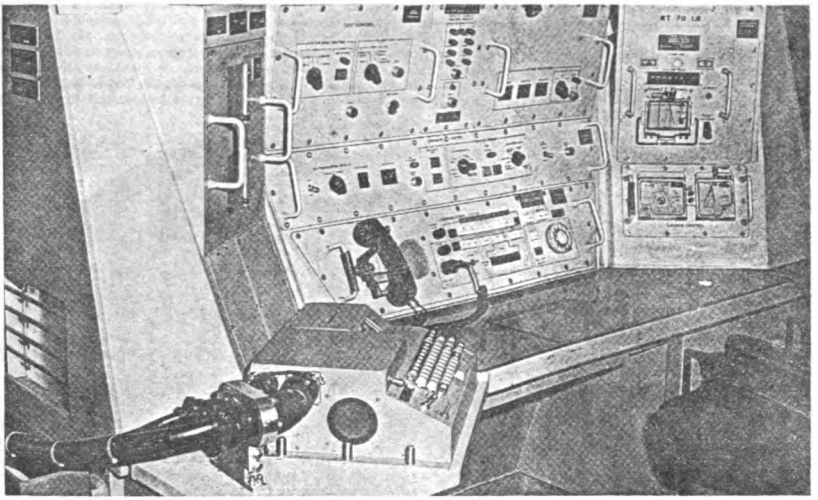
Since 1974 Schlesinger and other defense spokesmen have emphasized what they now seem to regard as two necessary new ingredients of a flexible-response strategy. One is the development of intercontinental ballistic missiles (ICBM's) capable of destroying "hardened" Russian military targets, such as missiles emplaced in blast-resistant underground silos. The other is a major expansion of the civil defense program, which has been largely inactive since the early 1960's. The purpose of the civil defense program would be to improve the credibility of the U.S. limited-nuclear-war posture by protecting the civilian population from the effects of limited Russian nuclear attacks. The new emphases give more weight to achieving a capability for fighting and "winning" a limited nuclear war.

This proposed shift in strategy and the weapons-development and civil defense measures being sought to support it have come under attack on two broad grounds. First, detailed calculations based on the properties of nuclear weapons of the coming decade suggest that the casualties from any militarily significant nuclear counterforce strike would be so devastatingly high that this concept of limited nuclear war loses meaning. Second, a counterforce strategy founded on the ability to destroy enemy ICBM's increases the chances of nuclear war.

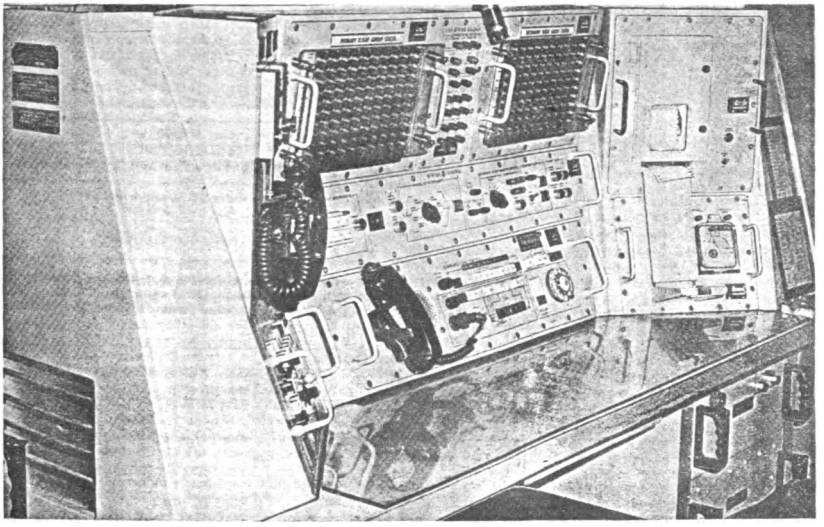
In his testimony before a subcommittee of the Senate Committee on Foreign Relations in March, 1974, Schlesinger supported his advocacy of such a counterforce capability by suggesting that a counterforce strike against the U.S. might result in "hundreds of thousands" of civilian casualties "as opposed to tens and hundreds of millions," which could result from an all-out nuclear exchange. Several senators were skeptical that a militarily significant strike could cause so few casualties; Senator Clifford P. Case of New Jersey in particular asked that the basis for the casualty calculations be further explained. In September, Schlesinger returned with Department of Defense computer calculations on the consequences of limited nuclear war. The figures indicated that if extensive civil defense protection were available and taken advantage of, a Russian attack on all 1,054 Minuteman and Titan ICBM's, with one one-megaton warhead targeted on each silo, would cause about 800,000 civilian deaths. Schlesinger concluded from this that "the likelihood of limited nuclear attacks cannot be challenged on the assumption that massive civilian fatalities and injuries would result."

Some senators were still skeptical, and the Congressional Office of Technology Assessment (OTA) was asked to review the Defense Department calculations. An expert panel including one of the present authors (Drell) reported back in February, 1975, that "the casualties calculated were substantially too low for the attacks in question as a result of a lack of attention to intermediate and long-term effects" of the nuclear explosions. Pointing out that the Russian strike postulated by the Defense Department was "evidently not designed to maximize destruction of U.S. ICBM's," the panel insisted that a real Russian effort to cause maximum damage to U.S.

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MINUTEMAN III missile combat-crew commander's console controls the launching of a flight of 10 missiles. The keyboard (*foreground*) is that of the Command Data Buffer system, which makes possible the resetting of targets in on-board computers in 36 minutes.



MINUTEMAN II console shown here is that of the deputy combat-crew commander. The consoles are in underground launch-control centers. The U.S. has 450 Minuteman II's and 550 Minuteman III's, the latter with multiple independently targetable reentry vehicles.

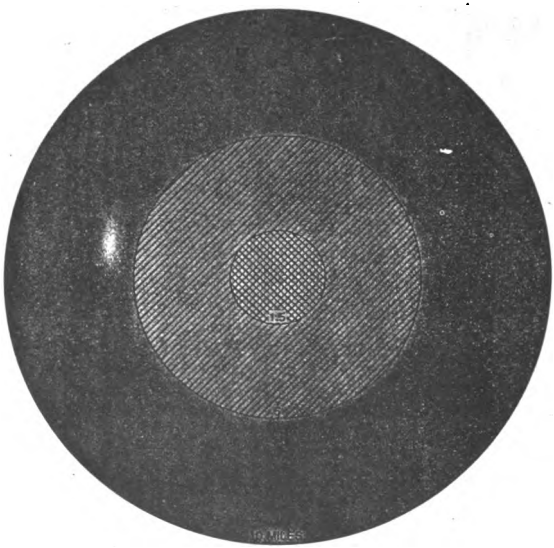
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strategic forces with weapons currently deployed or under development would in fact "inflict massive damage on U.S. society." The panel raised specific questions about some of the assumptions underlying the Defense Department's calculations, and it also asked for estimates of the probable degree of damage to U.S. military targets for postulated attacks. This is a critical point, since it would be specious and misleading to calculate a low casualty figure for some imagined trivial—and therefore unlikely—counterforce attack.

In response to the panel's critique Defense Department analysts tested the sensitivity of their calculations to the assumptions challenged by the panel and estimated the effectiveness of various possible Russian strikes. In what follows we shall consider these issues and some of the underlying technical factors. We shall draw in part on the Defense Department's results, which were reported in July, 1975, and also on an independent analysis, produced by Henry C. Kelly of the staff of the Office of Technology Assessment in collaboration with Richard L. Garwin and one of us (von Hippel), presented to the Committee on Foreign Relations that September. What emerges is this: Strikes causing relatively few casualties would be militarily insignificant; strikes inflicting appreciable damage on U.S. strategic forces would cause very large civilian casualties; even the most comprehensive counterforce attack that was postulated would leave the U.S. with such massive retaliatory capability as to make the counterforce strategy appear to be ineffective from the Russian point of view.

We begin by examining the techniques for calculating the civilian casualties resulting from a nuclear attack. Casualty levels depend sensitively on many factors, such as the nature of the attack, weather conditions and civil defense protection. The basic physics of warhead effects, however, is fairly well established and widely known; it is set forth most comprehensively in *The Effects of Nuclear Weapons*, a publication of the Department of Defense and the Atomic Energy Commission, edited by Samuel Glasstone, that was published originally in 1957 and in revised form in 1962.

For a low-altitude nuclear explosion releasing the energy equivalent of a million tons (one megaton) of TNT the immediate effects of blast, heat and nuclear radiation would extend over an area around ground zero with a radius of about 10 miles. At military targets near populated places, such as naval shipyards, missile-submarine bases and some command centers, the Defense Department calculated that blast fatalities alone would be between 50,000 and 100,000 per one-megaton warhead exploded high enough so that local radioactive fallout would not be a hazard. For military targets in places with a low population density, casualties from these immediate effects would be much lower. For such targets it is radioactive fallout that would account for most of the civilian casualties, and the fallout from a Russian attack on a Minuteman base could be lethal many hundreds of miles downwind. Considering the weapons that are deployed today or are likely



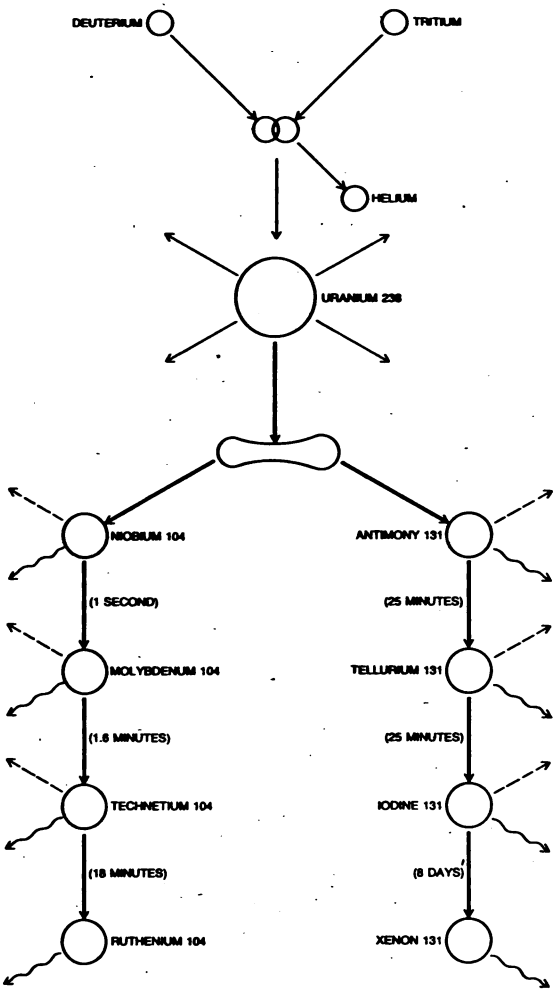
CAUSE	EFFECT
THERMAL RADIATION	BURNS AND FIRES, POSSIBLE FIRESTORM
BLAST	CASUALTIES FROM BUILDING COLLAPSE AND FLYING GLASS
NUCLEAR RADIATION	RADIATION DEATHS

IMMEDIATE EFFECTS of a nuclear explosion are due to the initial nuclear radiation, the air blast and the thermal radiation. The approximate radii at which the various effects would be significant are given here for a one-megaton nuclear warhead exploded near the surface.

DOSE (IN REMS)		EFFECT
IF DELIVERED OVER ONE WEEK	IF DELIVERED OVER ONE MONTH	
150	200	THRESHOLD FOR RADIATION ILLNESS
250	350	5 PERCENT MAY DIE
450	600	50 PERCENT MAY DIE

BIOLOGICAL EFFECTS of nuclear radiation vary with the rate at which a dose is delivered. The dose unit, the rem, takes into account the relative effectiveness of the type of radiation.

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FISSION PRODUCTS, the source of fallout radiation, are produced in the chain of events following a nuclear explosion, in this case a typical fission-fusion-fission explosion. Heated by an initial fusion explosion, the hydrogen isotopes deuterium and tritium fuse to form helium, releasing an energetic neutron (*colored arrow*). The neutron enters the nucleus of a uranium-238 atom, making it unstable; it fissions, releasing four neutrons and two radioactive daughter nuclei, or fission products. The fission products emit beta rays, or electrons (*broken arrows*), and gamma rays (*wavy arrows*), thus decaying to form new products. Each decay chain ultimately terminates in a stable isotope. For each transition there is a characteristic half-life, which tends to become longer as the stable stage is approached. Other decay chains, not illustrated here, produce the important long-lived radioisotopes strontium 90 and cesium 137.

to become available in the next decade, such an attack might be delivered by one megaton or two megatons of nuclear explosive fuzed to detonate near the surface at each of the 150 or 200 hardened ICBM silos at the base.

Radioactive fallout originates with the thousands of tons of soil, rock and other material that would be melted or vaporized by the heat of each explosion and mixed with its radioactive by-products. This debris would be carried to a height of some eight miles with the rising fireball. In the stratosphere the fireball would cool and the larger particles would descend to the ground within a day or so, over an area extending some hundreds of miles downwind, as "local" fallout. The smaller particles would drift great distances and eventually descend as global fallout.

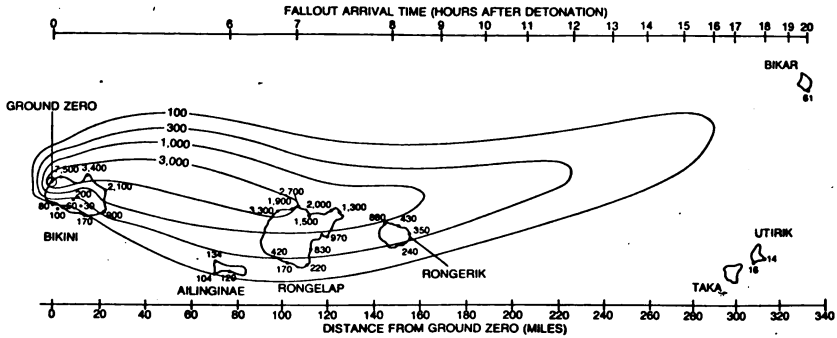
The hazards of local fallout were dramatized by the events that followed the first U.S. test of a fission-fusion-fission bomb (with a yield of 15 megatons) at Bikini Atoll on March 1, 1954 [*see illustration on opposite page*]. Fishermen 80 miles downwind received radiation doses that ultimately killed one of them. At the south end of Rongelap Atoll, 100 miles downwind, people suffered severe short-term and long-term radiation effects. If they had been living at the north end of the atoll, the higher radiation levels there would almost surely have killed them.

If people in the local-fallout zone did not (as the residents of Rongelap did) ingest contaminated food and water, the principal hazard would be external radiation from radioactive particles. (Most of the particles in local fallout would be too large for inhalation into the lungs.) If people did not stay outdoors and come into direct contact with fallout, thereby sustaining burns caused by beta particles (the short-range electrons emitted by radioactive nuclei), the major hazard would be the more penetrating gamma radiation.

In order to determine the distribution and consequences of local fallout one needs to know the fission yield and height of burst of each warhead, the biological effects of a given absorbed radiation dose, the dependence of the fallout pattern on weather conditions, the degree to which the population is sheltered and the geographic distribution and total megatonnage of the attack. Predictions of fatalities and injuries are sensitive to the assumptions one makes about each of these factors, which we shall consider in turn.

The radioactivity in the fallout would come mostly from fission. A "thermonuclear" weapon is typically a fission-fusion-fission device. A "small" fission explosive (one of the chain-reacting isotopes uranium 235 or plutonium 239)

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HAZARDS OF LOCAL FALLOUT downwind from a thermonuclear explosion were dramatized by the U.S. test of a 15-megaton fission-fusion-fission bomb on Bikini Atoll on March 1, 1954. The measurements (*black numbers*) give the total dose, in rems, that had accumulated 96 hours after the explosion. Contour lines calculated on the basis of those measurements outline the fallout pattern.

triggers a fusion explosion involving, for example, the hydrogen isotopes deuterium and tritium. The high-energy neutrons emitted by the fusion reactions then fission the nuclei of a large amount of the non-chain-reacting isotope uranium 238, releasing more fission energy [*see illustration on opposite page*]. In the Defense Department calculations 50 percent of the energy release was assumed to be due to fission, and that is a representative fraction.

The biological consequences of gamma radiation depend on the total dose received and the time period over which it is delivered. The median lethal radiation dose was taken by Defense Department analysts to be 450 rems for doses received within a few days. (The rem, standing for "roentgen equivalent man," is a unit of the biological effect of radiation.) For doses delivered over a longer time the lethal dose was taken to be somewhat higher because, given time, a biological system can repair a considerable amount of radiation damage. The effective dose suffered by the exposed population when the rate of repair just balances the rate of damage being done by the decaying ambient field of radiation would be the "maximum biological dose" and would determine the lethality of the exposure.

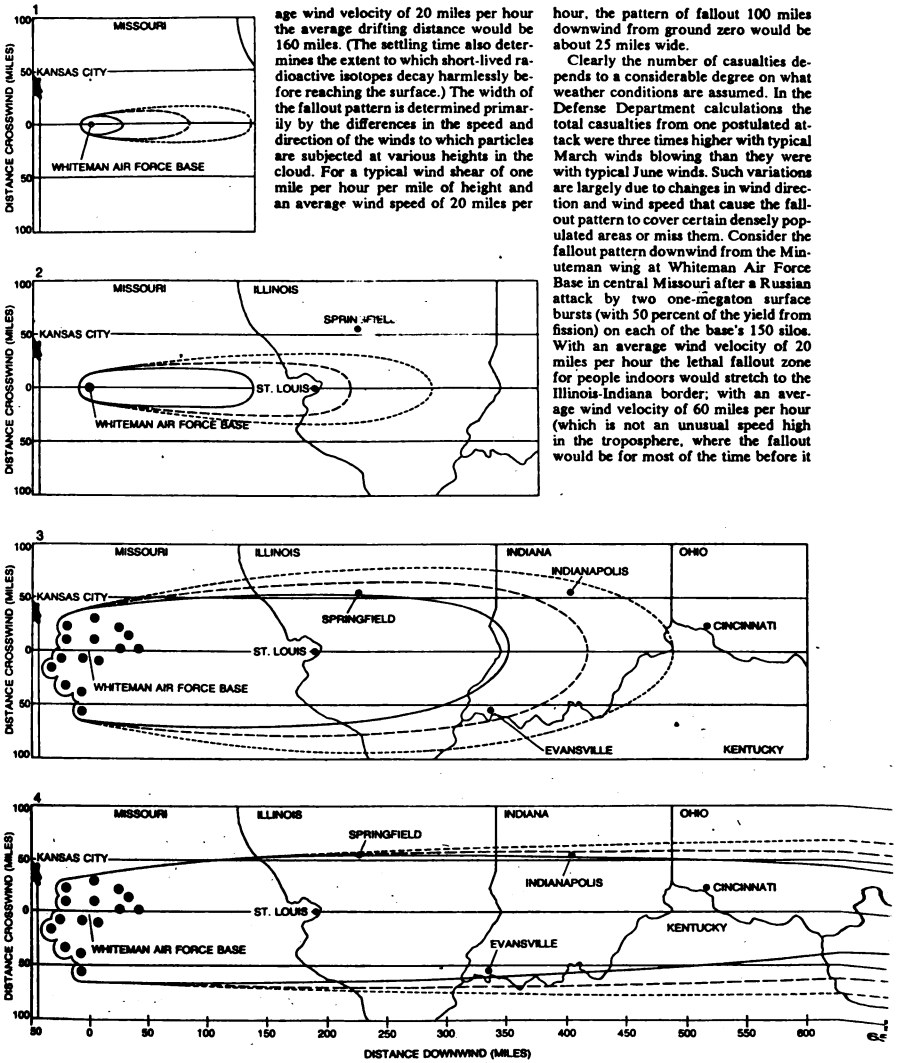
Death from radiation sickness would be neither quick nor painless. As described in the Glasstone book, "the initial symptoms are... nausea, vomiting, diarrhea, loss of appetite and malaise." Beginning two or three weeks after the exposure "there is a tendency to bleed into various organs, and small hemorrhages under the skin... are observed." Spontaneous bleeding from the mouth and intestinal tract is common. "Loss of hair... also starts after about two weeks.... Ulceration about the lips may... spread from the mouth through the entire gastrointestinal tract." Eventually "the decrease in the white cells of the blood and injury to other immune mechanisms of the body... allow an overwhelming infection to develop." One has only to multiply that description by the millions to get a partial picture of the possible consequences of "limited" nuclear attacks on the U.S. and the U.S.S.R.

If the fresh fission products from one megaton of fission were spread uniformly over a perfectly flat area of 1,000 square miles, the gamma-ray dose rate one meter above the ground would be about 250 rems per hour after 10 hours. For human beings the median lethal dose at such a high dose rate is about 450 rems. The gamma-ray dose rate would decrease about sixteenfold for every tenfold increase in time for the first six months after the explosion and more rapidly thereafter. In our example the radiation intensity would be down to about 15 rems per hour after four days and about one rem per hour after 40 days. For a person remaining in the radiation zone, however, the cumulative dose would continue to rise significantly for quite a long time. Consider the local fallout beginning about 10 hours after an explosion, which is a typical time for the fallout to reach ground level. A full 40 percent of the dose accumulating after that time would remain to be delivered after four days, and 25 percent of it would still remain to be delivered after 40 days.

The height of burst of the warheads, which has an important influence on the amount of fallout deposited downwind, would be affected by the choice of target. In the counterforce attacks envisioned by the Defense Department most of the megatonnage would be directed against underground Minuteman silos. The Department reported that the Minuteman-killing effectiveness of surface bursts and of airbursts at the "optimum height of burst" would be about equal. (The optimum height of burst is the height that, for a given yield, provides a blast pressure exceeding a certain value over the largest area; for a one-megaton yield and an overpressure of 1,000 pounds per square inch it would be about 1,000 feet.) The attacker would thus be faced with a trade-off. On the one hand a surface burst does not have to be as precisely placed as an airburst (an important consideration, since attacks on hardened targets put a high priority on accuracy). On the other hand, Defense Department calculations show that, other things being equal, for an attack on the U.S. ICBM's fallout fatalities could be four times higher for surface bursts than for airbursts.

The fireball from a one-megaton nuclear explosion and the fission products it contains rise rapidly until the top of the cooling fireball cloud enters the stratosphere, about six miles above sea level at middle latitudes. At a height of about eight miles the cloud stabilizes, with its fission products spread over an area about four miles in diameter. An average settling time for the local fallout from a one-megaton explosion might be about eight hours. The settling time and the average speed of the winds between the top of the fireball cloud and the ground determine how far the particles drift downwind. For a typical aver-

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FALLOUT PATTERNS are shown for attacks by one-megaton warheads (with 50 percent of their explosive yield from fission) exploded at the surface on ICBM's at Whiteman Air Force Base in Missouri. The contours correspond to maximum biological doses of 1,350 rems outdoors, or 450 rems (50 percent fatalities) inside an average residence (*solid line*); 450 rems outdoors (*broken line*), and 150 rems outdoors (*dotted line*), the approximate threshold for fatalities. The four patterns are for a single warhead (*1*), for one warhead

age wind velocity of 20 miles per hour the average drifting distance would be 160 miles. (The settling time also determines the extent to which short-lived radioactive isotopes decay harmlessly before reaching the surface.) The width of the fallout pattern is determined primarily by the differences in the speed and direction of the winds to which particles are subjected at various heights in the cloud. For a typical wind shear of one mile per hour per mile of height and an average wind speed of 20 miles per hour, the pattern of fallout 100 miles downwind from ground zero would be about 25 miles wide.

Clearly the number of casualties depends to a considerable degree on what weather conditions are assumed. In the Defense Department calculations the total casualties from one postulated attack were three times higher with typical March winds blowing than they were with typical June winds. Such variations are largely due to changes in wind direction and wind speed that cause the fallout pattern to cover certain densely populated areas or miss them. Consider the fallout pattern downwind from the Minuteman wing at Whiteman Air Force Base in central Missouri after a Russian attack by two one-megaton surface bursts (with 50 percent of the yield from fission) on each of the base's 150 silos. With an average wind velocity of 20 miles per hour the lethal fallout zone for people indoors would stretch to the Illinois-Indiana border; with an average wind velocity of 60 miles per hour (which is not an unusual speed high in the troposphere, where the fallout would be for most of the time before it

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settled to the ground) it would stretch all the way to the Virginia border [*see illustration on these two pages*]. The area within the lethal-dose contour would be very large: about 2 percent of the land area of the continental U.S.

There are six Minuteman bases from which comparably massive fields of lethal radiation would extend, and three 18-missile Titan bases as well. Hence in the event of a counterforce strike against U.S. missiles a substantial portion of the U.S. would be covered by the downwind radiation patterns from the thousands of nuclear explosions. And a significant fraction of the population, including the residents of many major Middle Western cities, would be in the zones of lethal radiation [*see illustration on next page*]. Presumably a map of the U.S.S.R. would show a similar pattern for a U.S. counterforce attack on that country.

The consequences of being caught in the fallout pattern downwind from a low-altitude or surface fission explosion would depend, of course, not only on the level of ground contamination but also on where one took refuge. Currently the U.S. civil defense program requires that for a shelter space to be identified as such it must shield against all but 1 to 2 percent of the fallout gamma radiation. The degree of protection a given shelter provides is characterized by its "protection factor," which is the reciprocal of the fraction of radiation that penetrates it. The current requirement is therefore a protection factor of 50 to 100. That degree of shielding can be provided by cover of approximately two feet of dirt or 16 inches of concrete. Those parts of a single-story residence that are above ground level have a protection factor of 3. The basement of the residence may have a protection factor of 20 to 40 if it is completely below ground level and therefore receives gamma radiation almost entirely from fallout that lands on the roof of the building.

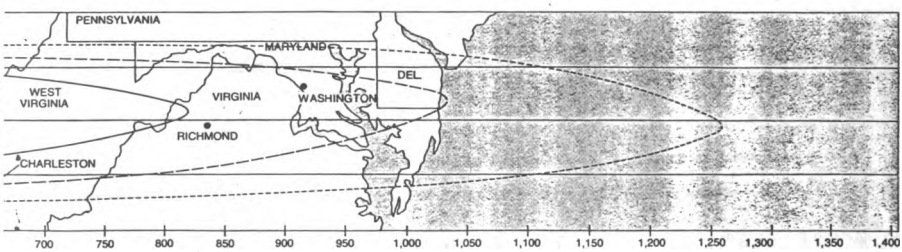
In the Defense Department calculations the postulated distribution of protection factors corresponds to assuming that about 60 percent of the people in the U.S. would seek and reach the best shelter available in their area [*see top illustration on page 35*]. The 40 percent who did not seek shelter or for whom shelter was not available were assigned a protection factor of 3, that of an average residence. It was found that halving the protection factors increased the number of deaths by more than 50 percent.

It is important to note that the Defense Department analysts assumed that people would remain sheltered for 30 days. At the current level of civil defense preparation it is highly unlikely that the population could remain so well sheltered for such a length of time. For a limited nuclear war to be taken seriously as a policy option—as a realistic threat in a confrontation with the U.S.S.R.—it would be necessary to make much better shelter arrangements. In other words, the U.S. would have to embark on a greatly enlarged civil defense program.

Indeed, the development of civil defense procedures requiring the massive evacuation and relocation of populations during crises has recently been proposed in the annual U.S. defense budget request as a necessary adjunct to the new strategy. The preparations required for such mass movements and for the support of the population for long periods away from home would have a major impact on U.S. peacetime society. Identified shelter spaces and evacuation plans by themselves would not constitute an effective civil defense program; a total system would have to be organized and woven into civilian life through training programs, rehearsals and volunteer activities.

An idea of the magnitude of a civil defense program that could achieve high shelter occupancy and maintain it for several weeks or longer can be gained from the system envisioned by the 1962 U.S. civil defense guide. The plans, which were never implemented, contemplated that for every shelter accommodating 100 civilians there should be an operating cadre of 25, of whom 10 or 12 would need training. That is, 10 percent of the sheltered population, or 20 percent of the adult population, would have to be trained. To recruit such a large cadre the Government would have to look beyond existing community safety personnel such as policemen, firemen and National Guard units.

One task of these trained people would be to operate communication systems over substantial distances in order to deal with any local shortage of food, water or medical supplies. They would also have to know how to use radiation dosimeters, because in the immediate postattack period the fallout levels could vary greatly from one place to another. (Like snow, radioactive debris accumulates where it is driven, depending on the wind, the weather and the topography, including buildings. There could be pockets of relative safety in the midst of areas with lethal levels of radiation.) The trained cadre would have to provide leadership in the long period of extreme social duress after the attack and reestablish services for a so-



on each of the 10 silos in a flight (*gray circle*) of Minutemen (*2*) and for two warheads on each of the 150 silos in Whiteman's 15 flights (*3 and 4*). The large difference between the bottom two patterns is the result of a change in the assumed wind speed. In all four cases the wind is assumed to blow toward the east. In the first three examples the wind speed is assumed to be constant at 20 miles per hour. In the bottom example the wind speed is assumed to be 60 miles per hour (averaged at altitudes between the surface and the stratosphere).

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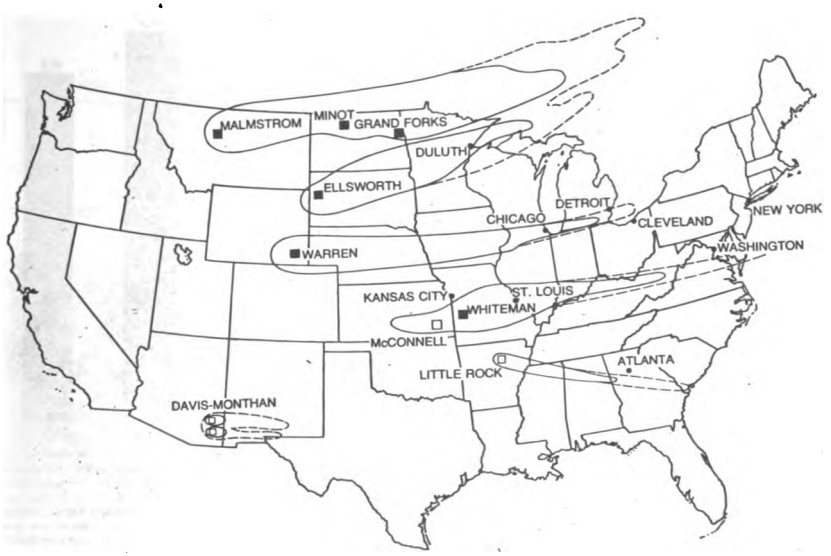
ciety with a large population of sick, injured and dying citizens. It should be noted that Defense Department calculations of the consequences of limited nuclear war are almost certainly serious underestimates. For example, the calculations omit any estimate of what may be one of the gravest consequences of all: the disruption of the intensely interdependent components that enable a modern society to function. The difficulties imposed on a society trying to recover with totally unprecedented levels of mortality and morbidity, with insufficient medical care and with profound dislocations in the supply of food and water are simply ignored. Moreover, the calculations omit any consideration of long-term consequences such as the millions of genetic defects and cases of cancer that would occur worldwide in the decades after the postulated nuclear attack.

A higher level of public awareness and concern and a willingness to participate in repeated civil defense exercises would be required if the U.S. intended to develop a viable system for a massive evacuation and shelter. In the absence of sustained preparation chaos and panic would surely ensue at the time of an attack. It is difficult to see how commitment to such plans could be obtained without a deliberate and sustained intensification of public apprehension concerning a nuclear war. One of the lessons of the relatively ineffective civil defense program of 1961 and 1962 was that the large expenditures for civil defense and the inconveniences of a major shelter program could only be made plausible to the American public by exaggerating the probability of nuclear war.

Today we are again hearing allegations that the U.S.S.R. is developing and rehearsing civil defense plans involving the evacuation and relocation of large populations, along with the dispersal and hardening of industry. These programs are cited to indicate that the U.S. may be losing its deterrent and to spur a renewed U.S. civil defense effort. What evidence is there in support of these allegations?

The Russians have written much on the subject and have given their people more intensive exposure to civil defense than Americans have received. Apparently they have also spent much more money on plans and organizations and have involved in exercises small numbers of individuals with key skills. In view of the unprecedentedly large scale of the nationwide disaster being considered, however, an effective civil defense program would surely have to include among its essential components full-scale rehearsals and survival-living exercises involving the population. If there had been any such rehearsals, we would have heard about them. They would be very difficult to conceal, and many people who would have participated in them or would have had knowledge of them have now left the U.S.S.R. and would have called attention to them. Yet no evidence of such exercises has been presented. The editor of the U.S. Government translation of the official Russian civil defense manual for 1974 comments that "the Soviet Union has not conducted mass shelter living experiments or even simulated ones as has been done in the U.S." Plans and manuals are very different from an effective operating system.

The Defense Department's response of July, 1975, presented new casualty figures and also estimates of the military effectiveness of the postulated attacks. According to the new calculations, a strike with two 550-kiloton warheads, one a surface burst and the other an airburst, against each of the 1,054



COUNTERFORCE ATTACK on all Titan (*white squares*) and Minuteman (*color squares*) ICBM bases, with two one-megaton surface bursts (50 percent fission yield) per silo, could produce these patterns. Each inner contour delimits a 450-rem dose indoors (50 percent fatalities) and each outer contour a 200-rem dose indoors (50 percent hospitalized). Typical March wind speeds are assumed.

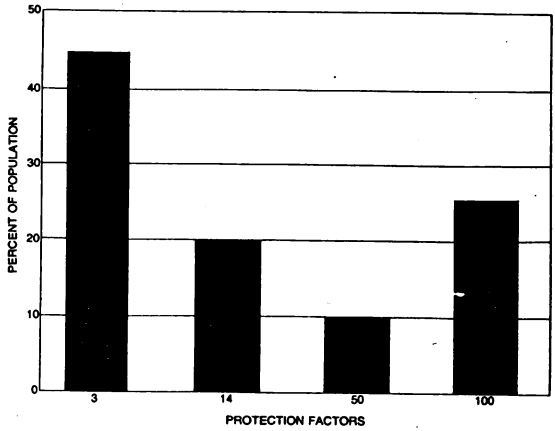
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U.S. ICBM silos would cause 5.6 million fatalities (assuming a 25 percent reduction of the population-protection factors given above) and destroy only 42 percent of the silos. A heavier strike with two three-megaton warheads, one a surface burst and the other an airburst, directed at each silo would cause 18.3 million fatalities and destroy 80 percent of the silos. A "comprehensive" attack, with two one-megaton surface bursts on each ICBM silo and strikes against the 46 Strategic Air Command (SAC) bases and the two bases for ballistic-missile submarines, would cause 16.3 million fatalities and destroy 57 percent of the ICBM's, 60 percent of the bombers caught on the ground and 90 percent of the missile submarines in port [*see bottom illustration at right*].

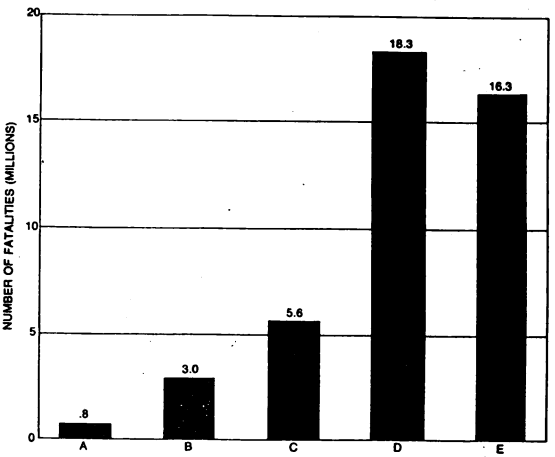
The effectiveness of all these attacks would be somewhat higher if one assumed that the incoming missiles were more accurate and would be somewhat lower if one assumed that the attacking force was less than 100 percent reliable. An additional factor in a massive attack involving many warheads arriving at about the same time in the same area is "fratricide" among the incoming missiles. In a concentrated attack the atmospheric disturbances created by the first warheads to arrive must necessarily destroy, disable or deflect many of the warheads that arrive later. Only the almost perfect synchronization of the arrival of warheads that are aimed at the same silo or nearby silos can avoid this effect.

In any case it is clear that even with a massive attack resulting in enormous devastation, including the direct death of 20 million Americans, the U.S.S.R. would have accomplished little of strategic military value. After the heaviest of the anti-ICBM strikes considered by the Defense Department, more than 200 ICBM's would survive: an overwhelming retaliatory force even if one ignores the SAC bombers, the missile submarines and the thousands of U.S. tactical nuclear weapons deployed overseas and on aircraft carriers. It is therefore at least misleading to suggest that a successful and strategically effective counterforce attack could be carried out with low civilian casualties.

A major danger associated with a policy reorientation that emphasizes preparations for actually waging a limited counterforce war is that it would tend to undermine the stability of the strategic balance. Flexibility is one thing and an efficient hard-target kill capability is another. Flexibility is inherent in the wide range of U.S. strategic weapons, which are targeted on a variety of urban, industrial and military objectives. Any one or any 100 of these weapons could be launched selectively. Furthermore, each missile or bomber has multiple tar-

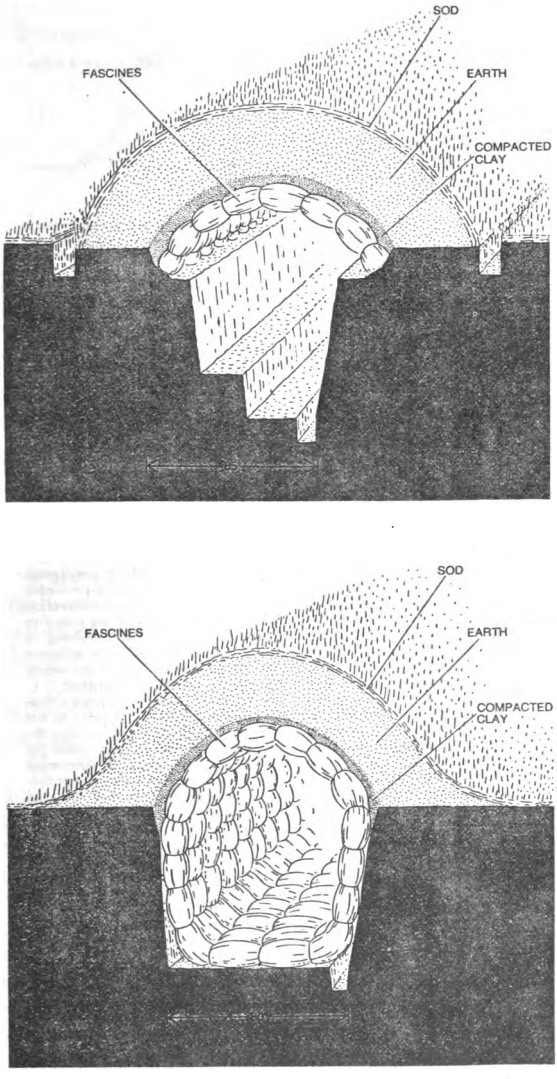


"SHELTER POSTURE" assumed in Department of Defense calculations is given by bars showing what percent of the population is in shelters that have given "protection factors" (the inverse of the proportion of outside gamma radiation penetrating the shelter). A protection factor of 3 is roughly that provided on the ground floor of a one-story residence; the basement of a one-story frame house could provide a factor of 15 to 20, that of a two-story brick house as much as 50. A trench covered by two feet of earth provides a protection factor of about 100.



FATALITIES estimated for five postulated Russian counterforce attacks are shown: one one-megaton airburst on each U.S. ICBM silo (*A*); the same attack with surface bursts (*B*); two 550-kiloton warheads per silo, one airburst and one surface burst (*C*); two three-megaton warheads per silo, one airburst and one surface burst (*D*); a "comprehensive" attack, with two one-megaton surface bursts per silo and with airbursts over all 46 Strategic Air Command bases and the two ballistic-missile submarine bases (*E*). In the last three cases the shelter posture shown in the illustration at the top of the page is "degraded" by 25 percent and March winds are assumed instead of August winds. Also in the last three cases Defense Department evaluated effectiveness of attack: 42 percent of the ICBM's destroyed (*C*); 80 percent destroyed (*D*); 57 percent of the ICBM's destroyed as well as heavy damage to aircraft on ground or flying within eight miles of a base and to submarines in port and base facilities (*E*).

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RUSSIAN SHELTER DESIGNS, from a 1970 U.S.S.R. handbook, are for simple structures to be built by people "using available materials and their own labor." A dugout (*top*) in firm clay soil is roofed by rows of fascines (bundles of brushwood, canes or reeds) covered with compacted clay and 30 inches of soil. Rings of fascines are required in looser soil (*bottom*).

get options. The new Command Data Buffer system currently nearing completion makes possible the remote resetting of targets in the on-board computers of Minuteman III missiles from launch-control centers in 36 minutes.

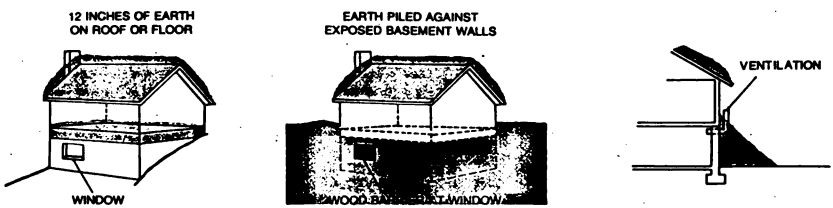
As a result of all this flexibility the U.S. also already has a substantial counterforce capability even without highly accurate warheads. There are, for example, "soft" military targets such as airfields and submarine bases that could be selectively destroyed with a few warheads. Even hard missile silos could be destroyed by hitting each one with a number of Minuteman missiles. The Defense Department nonetheless wants more: the ability to deliver counterforce strikes efficiently and with high confidence against hardened Russian ICBM silos. As Schlesinger put it in his 1976 appropriation request: "I believe we should improve our hard-target kill capability so as to have higher confidence of executing limited hard-target attacks." Indeed, the U.S. is currently progressing toward that goal with funded programs.

These developments clash directly with the need for strategic stability. A U.S. missile force with multiple independently targetable reentry vehicles (MIRV's) or with the maneuverable reentry vehicles (MARV's) now being developed, and with a demonstrated combination of very high reliability, very accurate guidance and high-yield warheads would suggest to Russian leaders the possibility of a U.S. preemptive strike against their ICBM silos. It would further suggest to them that in a time of confrontation they should not be caught with their missiles in their silos, that at such a time they should either strike first or adopt a "hair trigger," or launch-on-warning, policy. The same arguments apply with the U.S. and Russian roles reversed. The current national debate indicates that there is widespread concern, as there should be, about the possibility that the U.S.S.R. might be developing a hard-target counterforce capability, particularly in view of the larger size of the Russian ICBM's.

To be sure, it is impossible to envision a disarming first strike that would really threaten the retaliatory capacity of the U.S.S.R. (or of the U.S.), if only because missile submarines at sea and bombers in the air or on alert are not subject to destruction in a preemptive attack. In order to maintain a stable strategic environment such as the one that now exists for the two superpowers, however, there should be neither a real nor a "perceived" vulnerability of any major component of the strategic deterrent forces on either side. (From the Russian point of view this is true in particular of the land-based ICBM component, since it constitutes a much larger fraction of

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U.S. SHELTER DESIGN, redrawn from an illustration published by the Defense Civil Preparedness Agency, is for an "expedient shelter" intended primarily to accommodate evacuated populations. In order to provide adequate fallout protection in a basement that is only partially below ground level it is necessary to put a 12-inch layer of earth overhead and to pile earth against exposed basement walls.

their deterrent power: roughly 75 percent compared with 25 percent for the U.S.) The deployment of missiles with hard-target capability would therefore create tension, because each side would fear that such deployment might lead to the possibility of an effective first-strike threat against its force of silo-based ICBM's. The fact that formidable technical and operational difficulties, such as the fratricide problem, lead many people to challenge the feasibility of achieving such a capability is almost beside the point; there would still be serious concern about the ability of land-based ICBM's to survive a preemptive first strike.

U.S. officials recognize the danger of seeming to threaten Russian retaliatory capacity, and so they couple proposals for an improved hard-target kill capability with announcements that deployment of new offensive weapons would be limited, at least for the time being. But can one acquire just a little hard-target counterforce without bringing on the ill effects of a lot? After all, it is no more than the fear of a possible future Russian ICBM counterforce threat against U.S. Minutemen that has been cited in support of the ongoing programs for improving U.S. missiles. It has been argued that we must be able to respond in kind against each and every perceived potential threat. Schlesinger said that there should be "no perceived asymmetries in levels or capabilities of force—conventional or nuclear."

The danger in this logic is that we will almost inevitably find our own development program triggering a Russian commitment to the very program we fear (and vice versa, of course). All precedents, including in particular the history of MIRV deployment on both sides, indicate that once the technology has been developed and tested for attacking hardened counterforce targets with high confidence, the dynamics of the nuclear arms race will take over and make it difficult if not impossible for the U.S. to refrain from deploying the new weapons extensively and for the U.S.S.R. to refrain from responding in kind.

Neither side has yet developed weapons designed specifically as hard-target killers: weapons that have a high probability of destroying a hardened military target, such as an underground silo, with a single warhead. Research-and-development programs directed toward that goal are, however, funded in this year's U.S. defense budget. Before both countries are committed further and perhaps irrevocably to reciprocally stimulated and mutually reinforcing programs for developing such weapons, the hard questions should therefore be faced up to. Do we really want or need them? What is the value of being able to destroy an enemy silo (which may be empty by the time our warhead arrives) in response to an attack on our own silo? If a small response is wanted, will not an air base or a naval base or a military storage depot do as a target? Is not our current broad flexibility adequate? Will hard-target counterforce weapons make a compelling military contribution to national security or does their justification rest solely on ephemeral politico-strategic argument?

We have argued that such weapons would complicate the problem of maintaining strategic stability. It would therefore seem that it would serve the security of both the U.S. and the U.S.S.R. to avoid their development and deployment. A significant precedent for restraining new weapons in the interest of stability is the treaty, negotiated in the first round of the strategic-arms limitation talks, stringently limiting anti-ballistic-missile defenses. Now again the U.S. and the U.S.S.R. each have a critically important opportunity to limit their traditional technological arms competition by restraining the testing and deployment of new weapons designed to destroy hardened ICBM silos.

In the three decades since Hiroshima and Nagasaki there have been many crises involving the two superpowers, and the U.S. has fought two major land wars in Asia. Yet the armed nuclear truce has persisted. Why has neither side launched a single one of the thousands of nuclear warheads that each has had deployed? Surely it is because of the overwhelming fear of political leaders and citizens on both sides that once a nuclear weapon is detonated there will be an answering detonation, with subsequent exchanges escalating until both nations are destroyed and hundreds of millions of people are dead and dying. The issue created by the new emphasis on a selective, hard-target counterforce strategy accompanied by intensive civil defense efforts is whether or not there is any real prospect of escaping this "balance of terror." Should the assumption that a general nuclear war is prevented by the certainty of mutual destruction be abandoned in favor of the objective of fighting, winning and "surviving" a limited nuclear war when the evidence indicates that even a limited war would cause many millions of fatalities?

In the 1960's the U.S. adopted a strategic policy giving top priority to the prevention of nuclear war through deterrence rather than to preparation for fighting nuclear wars if deterrence should fail. Since then weapons technology has progressed, so that new and more sophisticated kinds of limited counterforce strikes, including attacks on hardened military targets, can be seriously considered. The political reality of deterrence, however, remains unchanged. New technology and new strategy do not significantly reduce the risk of all-out nuclear war breaking out once the first nuclear weapon has been fired.

It is important to recognize that once the nuclear firebreak has been crossed the decision to keep a war limited is no longer in the hands of one side alone; it has to be made by both—or all—participants in the conflict. As Secretary of State Henry A. Kissinger wrote in 1965: "No one knows how governments or people will react to a nuclear explosion under conditions where both sides possess vast arsenals."

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The CHAIRMAN. I might note that Dr. Joyce Kaufman is here today. We are delighted to see her. She is with Mr. Tirana and General Thompson. Dr. Kaufman was the expert in my office on women in the military, among many other military matters, and did a remarkably fine job.

Mr. Tirana, we are all interested in knowing what the taxpayer is getting for his money. You have been quoted in the papers as saying we are currently throwing away almost $100 million. In fact, you said we are throwing it down a rathole in our civil defense program.

Is that an accurate description of your views?

Mr. TIRANA. That was an accurate quotation. And actually, the taxpayers are getting something for their money, but it is not the "something" for which the money was appropriated.

The CHAIRMAN. Well, if we are throwing it down a rathole at a time when there is overwhelming public pressure to hold down spending, the whole campaign of 1978 was waged on that, why shouldn't we just abolish the program?

Mr. TIRANA. I think we have to make a collective decision as to whether we want to have a civil defense capability. And what I object to—and have objected to, and am trying to help sort out—is spending the $100 million in order to avoid making a clear decision as to whether we want to have a civil defense capability or not.

I think we can have a genuine civil defense capability. It must be built on a concept of crisis relocation. Because the only way that you can ever be able to protect the large number of Americans is by getting them outside of the vicinity of a weapon.

The CHAIRMAN. Now are you saying that, unless we develop a crisis relocation program, we probably ought to abolish the present effort and save $97 million?

Mr. TIRANA. Or at least recognize honestly what the present effort does. The money is, I think, well spent developing an organization nationwide of local governments and State governments and the Federal Government, to help respond to any crisis, peacetime, manmade or natural. That is what the organization does in fact do.

But we kid ourselves if we think that the organization provides a substantial civil defense capability; it does not. And I would say that, were I a Member of the Senate or House of Representatives, I would have substantial reservation about appropriating the $96 million for civil defense, as opposed to appropriating it for what it is—namely, an organization that can respond to emergencies.

The CHAIRMAN. Mr. Keeny, it is often assumed that because they are a more regimented society in the Soviet Union that they would be able to better conduct a massive evacuation. And yet the mechanics of such an evacuation effort are seldom discussed.

Can you describe the steps that are necessary to evacuate the largest Russian cities, and the methods of transportation that could be used to move this population, and the provisions that would have to be made for people at their destinations, and the probability of an effective evacuation within, say, a 3-day period?

Mr. KEENY. Senator Proxmire, I have considerable difficulty responding to that question, because I think the Soviets would also have difficulty.

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In reality, to the best of my knowledge, there is no evidence that the Soviets have ever undertaken a test evacuation of any city in the Soviet Union.

The CHAIRMAN. They have had no tests?

Mr. KEENY. No tests.

There may have been some paper plans and "exercises," in that sense, but there has never been an actual test evacuation of a city in the Soviet Union.

So the assessment of this is largely, or entirely based on the instructions and concepts they have in various manuals.

The CHAIRMAN. Isn't there a lack of auto transportation and a lack of the kind of road network we have, a need to marshal railroad cars in the right place far in advance, the difficulty of stockpiling food, the difficulty of dispersing the population concentrations in large cities, and weather problems during much of the year?

Mr. KEENY. You are exactly correct. These are the basic problems that one is faced with, and the Soviets would be faced with in implementing an evacuation concept.

If you want to compare them with the United States, their road networks, their availability of transport is much less than we have. And the problem——

The CHAIRMAN. Let me just interrupt.

The principal reason why the Russians have had lower fatalities in this chart that Dr. Drell has, for example, I take it is because it is assumed that they would initiate the first strike.

If we initiated the first strike, the figures might be the other way. Is that right?

Not that we're going to initiate a first strike, but that is my understanding of what this tells us.

Mr. KEENY. That is correct.

But in looking at the Soviets, the figures that you see on the chart deal only with prompt fatalities, or short-term facilities, from blast thermal effects, and people who would die within the first month from their initial exposure to radiation.

No account is taken in those figures of the problem of supplying food, water, medical support, or anything else of the type you just mentioned, to make viable the population that in fact has been evacuated; and that is the central problem—or one of the central problems of evacuation: How do you sustain the populace that has been moved by car or train, or on foot, from the urban areas? How do you sustain them over the very extended period that they might have to remain in shelters, lest they become victims of the residual radiation upon emerging from the shelters?

The CHAIRMAN. Well, this whole thing is such a strange nightmare, it is hard for us to think it through very carefully. But as I envision it, this could very easily be an exchange that wouldn't simply be a several-hour attack on our part or their part and a retaliation on our part, it could go on for months; in which case, of course, the casualties would be far, far greater. Isn't that right?

Mr. KEENY. That's correct.

In fact, in the particular model upon which these figures were based, we assumed that the United States withheld 10 to 15 percent of its

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weapons. They could either be withheld, or if some or all of them were retargeted and used against the population, we would vastly increase the number of fatalities as indicated on the chart.

The CHAIRMAN. One of the scenarios I have heard is that the Soviet Union would move their people out of the cities, and after we attacked them they would move them back in again. But the presumption there is that we would be foolish enough to use up everything we had in the first retaliation.

Mr. KEENY. Senator Proxmire, I think there are many things they might do, but that would be a most unlikely one. Because first of all, under this scenario, there would be no major city that had any significant amount of housing left standing. Some 90 percent would be burned or destroyed, and there would be essentially no industry surviving in the urban areas. And the urban areas would have tremendous intensities of radiation so that it would take many months before they could really be habitable again, or even usable part time for a labor force.

So I think it most unlikely that you would, at least for a considerable period, be able to move evacuated people back into the nonexisting cities.

The CHAIRMAN. Dr. Drell, would you explain in lay terms what would happen if a medium-sized nuclear weapon went off in downtown Milwaukee, or Washington, D.C., or Sacramento, Calif.? Would you please describe the short-term effects and the long-term effects.

Dr. DRELL. Well, let me define a "medium-sized weapon" to be 1 megaton as a typical weapon, if that is all right, and then we can go from there.

A 1-megaton weapon bursting near the ground or in the air would destroy ordinary structures—houses and what not—out to a distance of about 3 miles.

The CHAIRMAN. They would be vaporized?

Dr. DRELL. That's correct. The winds would be lethal—would hurl objects at lethal speeds to unsheltered people out to distances of 4 miles. These nuumbers I am giving you are what one learns from reading the AEC Weapons Effect Handbook published by the Government in 1964, and recently updated. They give a scale.

So one is talking about 50 square miles in which a person outdoors would be killed just due to blast and fire effects. Actually, second-degree burns on a clear day, if the weapon were airburst, would reach to distances of more than 11 miles, igniting leaves and causing second-degree burns for people who were out in the open.

So this gives an idea of the burst.

The CHAIRMAN. Well, why wouldn't that kill virtually everybody in any of those cities, unless they were in some basement?

Dr. DRELL. Unless they were sheltered, I think it would.

The CHAIRMAN. Anybody outside would be killed; anybody inside would be burned to death. The building would be blasted to smithereens, or vaporized, or burned.

Dr. DRELL. That's right. The buildings would be blasted to smithereens, as you say, out to distances of 3 miles, conservatively put, which is an area of some 30 square miles; and in an area of something like 300 square miles, people outdoors would get second-degree burns.

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Now, I have not even mentioned the radioactive fallout effect. If the weapon is detonated near ground, then you have thousands of tons of soil, rock, other material that is vaporized in the fireball. And it is shot up into the stratosphere from which it starts settling down again. The larger particles of the fallout will come down more quickly during a settling time of 8 to 10 hours. That is the local fallout. That is the fallout which would cause, as a rule of thumb in normal winds, I would say 1,000 square miles—500 to 1,000 square miles—to be so contaminated by radioactivity that a nonsheltered person could not reenter from 1-megaton explosion.

The CHAIRMAN. For how long?

Dr. DRELL. Approximately 2 weeks to 1 month. At 1 month, you still have 6 percent of the radioactivity falling out; that is, the total accumulated dosage beyond 1 month is still 6 percent of the total.

The CHAIRMAN. And isn't 1-megaton smaller than the average Soviet warhead?

Dr. DRELL. It is comparable to the average Soviet warhead. I don't know what the actual average is. They have some smaller and some bigger, but it is the scale of Soviet warheads.

The CHAIRMAN. Now, how do we defend ourselves against the heat, the blast, and the radiation?

Dr. DRELL. Against the blast, you would have to get yourself a blast shelter which would give you protection of the order of 100 pounds per square inch or more—more than the protection that the Washington subway would give you.

For 1 megaton, you would have, in terms of pound per square inch overpressure—you would be exposed to overpressures on the order of 35 pounds per square inch out at distances of 1½ miles.

The CHAIRMAN. We have a 95-mile subway, and how far does it go? Fifteen miles?

Dr. DRELL. If you are 1½ miles from a 1-megaton blast, I would suspect that in the subway your chances of survival due to blast are not very good.

In fact, I noticed that in the ACDA analysis, in terms of the typical, or representative, attack on Moscow, it was computed that for protection against blast of 50 pounds per square inch, which is higher than the number I gave you of 35, 30 percent of the occupants of 50 pounds per square inch blast shelters would be killed, and 60 percent would be injured, for a 90-percent casualty rate. So you are talking about very large numbers.

Now, the fallout problem is there also, because from 1 megaton burst near ground, something like close to a thousand square miles, with normal winds is seriously contaminated. The radioactive debris rises into the stratosphere some 40,000 feet high and is driven by the wind, as it is falling back down during the next 10 hours. If the winds are 40 miles an hour, the radioactivity will spread downwind some 200 to 400 miles.

And so there is a big area which is going to be contaminated for outdoor use.

The representative attack that ACDA considered in its analysis of Soviet fatalities made more than half of Moscow uninhabitable for more than 2 months after the attack.

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So this is the scale of devastation that one is talking about, just from the physical parameters that one can calculate.

The CHAIRMAN. Now, Mr. Keeny, Mr. T. K. Jones testified before the Joint Committee that the Russian evacuation plan could cut losses from the U.S. retaliatory strike to no more than 10 million.

This is very much at odds with your findings. Can you explain the basis for this discrepancy? And why is his estimate so different from yours?

Mr. KEENY. Senator Proxmire, this is one case where I think it is possible to explain the difference between studies. Normally, in this business, the calculations are so complex that——

The CHAIRMAN. I might say Mr. T. K. Jones is an expert, from the Boeing Corp., who has had a lot of experience in hardening industrial sites and pushing that kind of a program on this government.

Mr. KEENY. Yes, sir. I'm familiar with his studies. Normally, studies of this type are so complex that it is very difficult to sort out just what the fundamental differences are. In this case, however, it is possible to do so.

At the outset, I would say that I feel that his study is so severely flawed in its basic assumptions that its conclusions are totally misleading and should be ignored. What he apparently did was something along the following lines. To start with, he put aside some 60 million people who he said could not be touched anyway. They presumably lived in areas that would be untouched by nuclear war.

Then he took the remaining 220 million Soviets and dispersed them evenly over the entire 2½ million square miles of the populated area of the Soviet Union. This gave him an average density of less than 100 people per square mile.

He then assumed there would be no casualties from fallout—since, apparently, everyone would take sufficient precautions to protect themselves against whatever level of fallout happened to be in that vicinity. He then applied one blast criteria to the small number of people who he left in the cities and another to all the rest, who were spread out evenly over the entire populated area of the Soviet Union. Specifically, he assumed that only those who were subjected to, I believe it was 150 lbs. per square inch, which is a tremendous amount of pressure, would be fatalities, in the cities, since the urban population was all assumed to be in blast shelters. And in the rural areas, only people that were subjected to 7 lbs. per square inch would be fatalities.

Then he took simple ratios of the areas covered by these overpressures to the total urban areas and the total populated area of the Soviet Union and came up with his number of 10 million.

As a first comment, I would say that all of European Russia has less than a million square miles of populated area. Thus, his figures seem wrong by a factor of 2½ to 3, just by inspection, before you start, unless you assume that the Soviets are going to evacuate people from the Moscow area to Vladisvostok as part of the evacuation exercise.

Now, using the same methodology as Mr. Jones, and assuming a reasonable dispersion of people—for example, around the Moscow-Leningrad-Kiev areas one would have to disperse people to the associated rural areas, where there is also a much higher density of the

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people in the Soviet Union than in remote rural regions, we come out with some 60 million fatalities.

My personal view is that the T. K. Jones study is dangerously misleading, and I think it is most unfortunate that the United States and perhaps other countries should be led to this erroneous impression about what the consequences of nuclear war would be.

He also made a number of statements about the Soviets hardening their society and their industry—that others have referred to already—that I think are equally erroneous.

To begin with, I don't think there is any evidence of serious dispersal by the Soviet Union of their industrial capacity. If anything, it has become more concentrated.

The CHAIRMAN. And that is the kind of thing our intelligence could certainly tell us.

Mr. KEENY. The Soviets are continuing to build up their large factories in or near cities, modernizing them, as someone suggested. In addition to that, although there is some talk in their manuals about hardening equipment, I think there is little or no evidence that they are actually undertaking hardening of their industrial facilities.

In a more general sense, I think that, if one is willing to pile dirt over a lathe or heavy equipment, you can get a substantial degree of protection of it from blast.

I think it is very questionable, however, that even the most ingenious people will be able to harden a petroleum refinery, or a light industry, or a steel mill by using similar techniques. It is a totally different problem, hardening a few pieces of equipment, as opposed to really hardening your entire industrial base.

As I think I noted in my testimony, we indicated that with a generated alert, we would destroy some 85 to 90 percent of Soviet industry. And, if anything, I think that understates the problem, because we took a very simple approach, where we took a listing of several thousand Soviet industries and did not attempt to put them in any ordering of importance, which clearly, in a real war plan, one would do.

So, when we say 85 to 90 percent, one can assume that all of the really key industry would certainly be covered. And beyond that, we independently looked, in our study, at the effect on collateral industry—that is, industry that just wasn't on the list, but we knew about. It turns out that the amount of destruction of the secondary collateral industry is almost as high as the industry that is targeted, simply by virtue of the collocation and congestion of Soviet industry. Other agencies have done similar analyses.

So, I would not only strongly dissent from Mr. Jones' assessment of the population fatalities, but suggest that his assessment of hardening is not only unrelated to the facts in the case at the present time, but even not a theoretical possibility in the terms he proposes.

The CHAIRMAN. Thank you, Mr. Keeny.

Mr. Tirana, would you briefly describe the options the administration considered in developing a new civil defense policy? Let me ask the questions, so that you will see how we should go. How big a program is the administration envisioning—that is, how much money, in dollars? How much will it cost? What are the 5-year projections of what we will actually be getting for our money?

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Mr. TIRANA. In August 1977, Secretary Brown directed a study of civil defense program options. In the fall of 1977, we undertook a workshop—a number of Department of Defense employees, private persons from the outside—and an unclassified study was produced, copies of which have been furnished to your committee.

The unclassified study reflects essentially the option of continuing the present level of emphasis, which is basically to give a little bit of fallout protection in place should an attack arise by miscalculation or mistake..

The funding costs of that would cotninue to be approximately $100 million a year, most of which goes to State and local governments for maintaining the existing organization.

A second option is to get people out of town.

As Dr. Drell's, or the Arms Control and Disarmament Agency's, figures will reflect, and as all of the discussion today has reflected, the nature of the weapons is so terrifying, in their ability to destroy cities so overwhelmingly, that the only sound defense—at least in terms of what could work on paper—is to get most of your population out of high risk areas.

The costs of developing such a capability—in the unclassified study, if I recall—amounted to somewhere about $1.6 or $1.7 billion over a number of years.

A third option is to——

The CHAIRMAN. Over how many years?

Mr. TIRANA. Over a certain number of years, whatever you want. It depends upon how fast you want to develop the capability.

The third option is the construction of blast shelters—that is, shelters with blast doors, special ventilating kits, stocked, so that if one went down into it, there would be protection against the overpressures that Dr. Drell described and the severe heat, as well as protection against fallout.

The rough cost of developing blast shelters—and by this I do not mean fallout shelter; I mean concrete-reinforced cans, if you will—the incremental cost in new apartment and public building construction would run about $60 billion. That is a rough estimate.

The CHAIRMAN. How many people would be protected?

Mr. TIRANA. You would get protection for most of the population.

The CHAIRMAN. For $60 billion?

Mr. TIRANA. $60 billion, incrementally. This is the add-on cost to pay for the additional expense for constructing the blast shelter as you build your new apartment house or your new office building.

The CHAIRMAN. How long would that take?

Mr. TIRANA. It would probably take 15 or 20 years. To use a comparison, I believe the CIA report on the Soviet civil defense indicated that blast shelter had been constructed for 10 to 20 million of the Soviet population.

The CHAIRMAN. Which of these options did the administration——

Mr. TIRANA. The Secretary of Defense, on December 20, 1977, selected a program option for crisis relocation that would cost an average of $230 million per year over a 5-year period.

That program decision was subject to policy review, and then, obviously, a budget decision by the President. The President's policy

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decision of September 29, 1978, is, in my view, consistent with Secretary's Brown's——

The CHAIRMAN. What was that decision?

Mr. TIRANA. That was the decision that was discussed this morning, but, in essence, the National Security Council undertook a policy review at the same time that Secretary Brown directed a study of program options.

This was an interagency study of U.S. civil defense policies and programs, taking into account Soviet civil defense efforts, among other factors.

Following his review of the study recommendations, President Carter decided upon a civil defense policy and program.

Briefly, the President's policy acknowledged that civil defense is an element of the strategic balance and, in conjunction with our offensive and defensive forces, will serve to enhance deterrence and stability.

The CHAIRMAN. What was the dollar amount, the bottom line?

Mr. TIRANA. That policy decision did not include a budget decision.

The CHAIRMAN. Now, the latest figure we've heard is $114 million. We have heard other figures, too. What is the latest determination? The budget must be pretty much in place now for 1980.

Mr. TIRANA. I do not know, and I have a tendency to run from classified information.

The CHAIRMAN. Is that classified?

Mr. TIRANA. At this point I believe the budget process is at a classified or confidential—whatever it is, I can't tell you. And, fortunately, I don't know, so I am not embarrassed.

The CHAIRMAN. Is there a range that is sanitized?

Mr. TIRANA. Well, I can give you——

The CHAIRMAN. Obviously, we have to know sometime.

Mr. TIRANA. You are going to know this month.

I don't think—the important fact is the precise dollar level of fiscal 1980 request. The important question is: Do you want to buy a crisis relocation capability?

If we do want to buy that capability, I can advise you that it is the judgment of the Department of Defense that the rough costs will average $230 million a year over a 5-year period.

The CHAIRMAN. Does that mean then, if it is much less than the $230 million, we are starting a crisis relocation in 1980?

Mr. TIRANA. No, it doesn't mean that at all, because we have to start small.

The CHAIRMAN. Well, you have a $97 million program now. About all you do is allow for inflation when you go to $114 million. You are not really beginning any kind of a new program for relocation if you are going to add $3 or $4 or $5 million. That wouldn't buy the roadmaps for even 10 percent.

Mr. TIRANA. But you can figure out about what roadmaps you need. You may not be able to buy the roadmaps, but the one thing—in the 1979 authorization, there was an amendment requiring my agency to complete some crisis relocation planning for counterforce target areas.

This is an amendment which was introduced last year. If we have less money in fiscal 1980 to begin with, perhaps we concentrate on the counterforce areas and the experience we have learned in completing

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the plan, since we are pretty far along. And then we have a better base and a better understanding for moving into some of the more difficult areas.

The CHAIRMAN. Let me ask you, Dr. Drell—one of the problems with this No. 1 option, of relocation, is the pattern of how we relocate. As I understand, the people on the eastern seaboard, where we have perhaps the heaviest concentration of population in the country, would be moved west. Wouldn't that be a movement into the pattern of fallout?

Dr. DRELL. The answer is "Yes." As I understand the relocation, the most severe portion of the program to even understand and make credible would be the evacuation out of the northeastern cities where you have many people moving into an area where there are very few people, and there is a comparable problem from the two metropolitan areas in California, out into the desert. And there the problem is most severe.

So, if one wanted to make a modest beginning, as Mr. Tirana said, you might start with the areas near counterforce targets, the high-risk areas where you have low population densities, and learn what it really means to have an operating system in which you are relocating a small population into areas with big populations.

I recall some numbers, which I think were in the ACDA study, which showed that in a counterforce strike, in fact, you increase the casualties by relocating people out of the cities, because they were going west toward the fallout and out of the cities.

So, in select counterforce strikes, it is not clear that relocation will save casualties. It will certainly save casualties when you talk about large-scale predetermined attacks as my table shows.

The CHAIRMAN. For the short period, but the fallout effect could counteract that, couldn't it? In other words, people might not be killed as readily by the initial effects, but the fallout, over a period of months, might kill them.

Dr. DRELL. One is always assuming in these calculations, that the evacuees are sheltered with—shall I say—strong protection. The evacuees are not moving out into the countryside and sitting out in the open. They are credited with the same protection as the rural population.

They were assumed to be protected from all but 5 percent or so of the fallout. So, there is factored into these calculations the assumption of extensive sheltering of the evacuees.

There is also another problem, which I think is, in part, responsive to your prior question to Mr. Keeny about the difference with T. K. Jones' studies. Jones' studies assumed, as I have seen them, that once an evacuee enters his rural shelter he stays there 100 percent of the time. You have to recognize that a shelter with a protection factor of, say, 200, such as is used in Jones' studies—if the occupant feels it necessary, for whatever sanitary or otherwise reasons, to leave that shelter and to go outdoors for no more than 30 or 40 minutes a day, that that shelter protection is effectively reduced by a factor of close to 7.

And this is a very severe effect upon the casualty calculations and the fatality levels—namely, does the person live as a mole in the shelter 100 percent of the time for the first month, or is he allowed outdoors for 30 or 40 minutes? That type of sensitivity exists in these numbers.

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The ACDA study also looked into effects of individuals being out-of-doors for 40 minutes a day.

The CHAIRMAN. What we are saying then is that the studies are unrealistic if you expect to survive. After all, looking at the short-term effects and the long-term effects would be quite different.

Dr. DRELL. I believe the most that can be said about the studies—any study—is that they have calculated what I would call fragile, minimum levels of fatalities, because they are very sensitive to the assumptions. They change, for example depending upon whether you have two-thirds or 100 percent occupancy of the shelters.

The results are sensitive to the assumptions is what I am saying.

In any event the long-term effects are not included—well, how do you factor in pestilence when the sanitation system breaks down, when there are bodies dying in shelters throughout a 2-month period that can't be buried, and pestilence, such as cholera or typhoid break out?

How do you factor in the fact that these people are assumed to be living in shelters in which each individual is assigned less than 1 square meter of space, and perhaps even the ventilation system is no longer working very well?

There are very severe, neglected factors.

The CHAIRMAN. Mr. Tirana, have you given any consideration to what would happen in a case where an international crisis continued in an unresolved fashion for a considerable period after an evacuation was ordered? This is without nuclear attack but an evacuation—who would provide the food, the housing, and other goods for the significant population during an extended evacuation?

And how would you deal with the ever-increasing problems of lost production, hunger, unrest between evacuees, and defection back into the evacuated area, and security and crime control problems in the evacuated area? Have those been confronted at all?

Mr. TIRANA. Yes, they have. I would like to back up a little bit and tell you what the career staff of the agency has done over the past 15 years with the $100 million a year. In addition to maintaining the organization, it has done an extraordinary amount of research into problems, for instance, of how do you protect your crops, how do you protect your livestock, how do you handle the enormous problems, for instance, of getting 10 million people off Long Island and over the Throg's Neck Bridge up into northern New York State? How do you deal with the problem of Los Angeles? Is it feasible to let the population of Los Angeles County, which is about 4 percent of the total U.S. population, out into the desert to the east?

Yes, all of these questions have been considered.

The CHAIRMAN. Well, let me ask you specifically. You have answered some of them, but you haven't answered others. Unrest between evacuees. People stream out of New York by the hundreds of thousands and go into little towns, and the food supply, obviously, in the little town is barely enough for the people who live there. What can be done?

Mr. TIRANA. Let me give you the kind of example from history as to what has been done. On September 1 to 3, 1939, the British deliberately moved 1½ million women and children from London and few other large cities in an evacuation, and Britain did not declare war until

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September 3, after this move took place. In that evacuation, another factor occurred——

The CHAIRMAN. Now, say that again. They moved how many people?

Mr. TIRANA [continuing]. A million and a half.

The CHAIRMAN. And Britain is a country of 50 million people?

Mr. TIRANA. Yes.

The CHAIRMAN. So they were dispersed over a period of——

Mr. TIRANA. Three days.

The CHAIRMAN. That is a much, much smaller kind of evacuation than we are talking about. We're talking about almost the reverse kind of situation, where you take 50 million people and put them out where there have been a million.

Mr. TIRANA. I concede once you get to the host areas, you have got staggering problems, the magnitude of which I will get to in a second. But the fact of being able to get a million and a half people out of town, not only did they get a million and a half out, but another 2 million, they discovered later on, went spontaneously, unplanned. Some of them went to the wrong place, in Coventry, where they got bombed.

In Hurricane Carla in 1961, about three-quarters of a million people were evacuated from the gulf coast cities in the United States. Now, granted, they were just getting away from a hurricane, but they did get out.

Parisians left Paris in the face of the Wehrmacht. You had a virtual complete evacuation of East Prussia in the winter of 1944 and 1945 ahead of the oncoming Soviet troops. You have Soviet evacuations in World War II. You have evacuations——

The CHAIRMAN. How big were they? Have you had an evacuation where you would evacuate a population that is many times larger than the places where they are supposed to move?

Mr. TIRANA. Nothing like this ever has taken place in history, to my knowledge. It would be utterly gruesome. I am reminded of a friend of mine who was president of the New York City School Board during World War II. He tried to arrange for the evacuation of schoolchildren into the suburbs and had problems for sociological reasons.

The CHAIRMAN. Staff suggests the evacuation of Phnom Penh.

Mr. TIRANA. I don't think that would be as difficult as this. But the problem or the problems that would be confronted, yes, they would be staggering.

What are the alternatives? Do we want not to have any option of protecting people? If there were an intense crisis such that the President might even consider something as drastic as a directed evacuation, one must ask whether there wouldn't also be a spontaneous evacuation as there was, let's say, in Florida, during the Cuban missile crisis. People began to get out.

What would happen to this country in the event there were no plans and you had a crisis so intense? Would the population be better off for lack of plans than for it? That is the judgment question.

I suppose probably one of the most fluent comments or moving comments made was that of Bill Kincade in the Christian Science Monitor of December 6. In writing about the President's decision he said:

In September the President signed a directive that will improve the Government's capacity at the Federal, State, and local levels, to continue functioning

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after a nuclear attack. At the same time, the directive calls for an increase in existing efforts for stand-by plans for evacuating American cities prior to a nuclear attack.

Crisis relocation planning, the title of the program, is far from a sure-fire way to save lives in a nuclear war. For one thing, to be effective, it requires precise, advance knowledge of the timing of an enemy attack and the assurance that the adversary won't alter this timing to strike during the evacuation—when all analysts agree injuries and fatalities would be higher than if no evacuation took place.

Despite these problematic assumptions, relocation planning makes sense, because: (1) the cost is low; (2) it would be imprudent not to have such plans in the event reality validates the assumptions; and (3) the Government has the most fundamental obligation to try to save lives, even if it can only alter the casualties from large-scale nuclear exchange by a few percentage points or tenths of a percentage point.

The CHAIRMAN. Let me ask you another question that is not related to that, but it is important to us. Why is the administration dragging its feet on appointing a director to the Federal Emergency Management Agency? The plan was sent to Congress in June and became effective in September, and they have not made an appointment yet.

Mr. TIRANA. I know that several candidates are under consideration. I cant' answer that question.

The CHAIRMAN. Mr. Keeny, you say that, and I quote, "There is actually little evidence of Russian efforts to harden industrial facilities." Now, proponents of a massive civil defense program have argued that hardening can be productive and that the Russians have embarked on an extensive program to harden their industrial facilities.

Can you discuss your findings on Soviet industrial hardening and the efficacy of any such efforts?

Mr. KEENY. Senator Proxmire, I'm simply not aware of any evidence of significant efforts of this type on the part of the Soviet Union.

The CHAIRMAN. Do you think we would be aware if the Soviet Union engaged in a widespread program of hardening of their industry?

Mr. KEENY. I think we certainly would be. Now, they might undertake some contingency plans to harden certain critical equipment that we might not be aware of. But it was my suggestion in my earlier comments——

The CHAIRMAN. Are you aware that Mr. Jones, when he appeared before the committee, had some photographs showing the hardening, or at least they purported to show the hardening, of various industrial sites by the Soviet Union?

Mr. KEENY. As I recall the several versions of his study, I thought the photographs he had were of drawings from Soviet manuals or some photographs of experiments that his company was undertaking.

The CHAIRMAN. At any rate, you're not aware of any Soviet program for hardening their industry?

Mr. KEENY. Other than the discussions in the manuals and possible contingency interest on the part——

The CHAIRMAN. Do you have any idea as to where we might be able to get whatever intelligence is available on this?

Mr. KEENY. I would suggest on this question you should get a briefing from the intelligence community. The CIA specifically has undertaken an extensive study on this subject, and I'm sure they would be glad to share with your committee anything they know.

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The CHAIRMAN. Gentlemen, I have a brief statement I would like to make in conclusion of the hearings now. The conflicting testimony from our expert witnesses and Government spokesmen during this hearing points out very clearly that the United States still does not have a coherent, understandable civil defense program. We do have a Presidential policy of the most general type, that civil defense should be considered part of our deterrent strategy because it enhances stability and it reduces the possibility of coercion.

But there is no translation of this policy into a recognizable budget commitment, and playing with an annual budget figure from $145 million to $114 million does not lend much confidence to the policy itself.

There is general agreement, even among those who strongly disagree on other issues, that a modest program might make sense—a program of population evacuation planning would save lives. It would not reduce the likelihood of nuclear war, but would save lives.

It does make sense to take whatever measures are practicable to save our civilian population if war should break out, and protect against natural and manmade disasters such as terrorist attacks. But is it practical? Will more planning make it possible to map out how our populous east coast will evacuate and live off the land outside the metropolitan areas? Can we solve the transportation, food, medical, law enforcement, electric and power requirements which would be attendant with a mass migration? Would people actually leave? Would they obey the plan? Would industry actually cooperate by providing foodstocks and transportation and vehicles? Does such a system need to be tested and, if tested, what would that do to our strategic relationship with the U.S.S.R.? Would it snowball into a nationwide shelter system, costing $60 billion?

What we have here is a lack of leadership. We need a clear, unambiguous statement of facts from this administration. We need someone to stand up and say, this is what our civil defense policy is, this is how much it is going to cost, and this is why we need to do it. President Kennedy announced his civil defense policy; the Nation instinctively rallied to his cause. A year or so later, when detailed studies had shown that civil defense was not cost-effective, the program was called off.

Speaking only for myself, I believe that the population evacuation might be accomplished in many cases under favorable circumstances, the largest cities posing the most intractable problems. We should take some of the $97 million we are spending annually on civil defense, which we have heard at least twice today is being wasted, and turn it toward sound evaluation of the feasibility of population evacuation.

I would not endorse a huge program of planning, since we have seen over and over that plans lead to more plans, more planners, more bureaucracy, and endless generation of wasted action. But a good, hard-hitting practical evacuation effort just might be the kind of insurance our population needs.

I believe in the constitutional requirement that our Government should protect its population as a primary goal of government. This does not mean that we should resurrect the ABM, the bomb shelter scare of the 1960's, or provide our people with a sense of false security. Rather, it is the recognition that a prudent policy demands a prudent followthrough, and to date that has been lacking.

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I want to thank you very much for excellent testimony. You have made a fine record. We deeply appreciate it.

The committee stands adjourned.

[Whereupon, at 4 p.m., the hearing was adjourned.]

[Additional material supplied for the record follows in the appendix.]

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APPENDIX 1

UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY

AN ANALYSIS OF
CIVIL DEFENSE IN NUCLEAR WAR

December 1978

Summary

This report presents a summary of the effectiveness of civil defense in a nuclear war. The results are applicable to the mid-1980s time period with the U.S. and Soviet forces projected under a SALT TWO agreement. The analyses were based on a Soviet first strike and a U.S. retaliatory attack.

A comparison was made of the vulnerability of the U.S. and the Soviet Union to nuclear attack. It was found that both countries are roughly equally vulnerable although urban density and population collocation with industry is greater in the Soviet Union.

The effect of the U.S. retaliatory attack against key Soviet industry caused:

— 65 to 70 percent destruction from a normal day-to-day alert of our strategic forces;
— 85 to 90 percent destruction from a generated alert of these forces.

Any attempts at industrial hardening would be of little use in view of the fact that detonating weapons at lower altitudes can create immensely greater levels of blast overpressure. Furthermore, future U.S. weapon systems would offset 1½ to 3 fold increases in hardness.

While people were not targeted, human fatalities from the attacks were still immense, on the order of 100 millions from the prompt effects alone, without civil defense. In-place shelter protection could reduce the fatalities by 20%, but this effect would be offset if the strategic forces were put on generated alert. Evacuation of the urban areas, if it can be implemented, would substantially reduce the fatalities from short-term effects to the order of 25 to 35 million in the Soviet Union. However, weapons could be used against the evacuated population with ground bursts, causing as much as 70 to 85 million fatalities in the Soviet Union even if the Soviet evacuation and sheltering plan is fully implemented. U.S. fatalities were generally found to be even higher than Soviet fatalities due primarily to factors not associated with civil defense; that is, the analyses were based on Soviet first strikes and Soviet weapons have higher yields than U.S. weapons. The less extensive U.S. sheltering capability would be a minor factor in this difference.

Many other effects of nuclear war are also discussed, including:

— The destruction of 80% of all Soviet cities with populations above 25,000.
— The massive destruction caused by fires that could not be fought due to radiation and lack of water.
— The extreme radiation doses (up to 30,000 roentgens) in the urban areas.

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— The large casualty rates for people located in even very hard blast shelters.

— The fact that people that survive blast would have to stay in shelters for weeks or months.

— The shortage of food and water which would force many people to leave shelters.

— The fact that there would be 30 to 50 million injured in addition to the high fatality levels.

— The shortage of medical care due to destruction of hospitals (80% of all Soviet urban hospitals were destroyed).

— The effect of the attacks on agriculture - crops would be only moderately affected but livestock destruction would be serious.

— The effect of the attack on the earth ozone layer, in addition to the possible long term genetic and climatic changes.

One can conclude from the above that:

— The fatalities and industrial damage presented in this report represent only a part of the total disaster of a massive nuclear war.

— Many of these effects are difficult to measure and simulate on computers; nevertheless, they are real factors which must be considered.

— While some civil defense activities, such as evacuation, have some effect on the immediate post attack environment, their benefits in the long run have not yet been established.

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An Analysis of Civil Defense in Nuclear War

I. Introduction

The purpose of this report is to present an unclassified summary of a series of detailed analyses of the potential effectiveness of civil defense in a nuclear war environment. The results of the analyses are applicable to the mid-1980s time period. Moreover, they assume that U.S. and Soviet strategic forces will be in accordance with the forces currently projected under a SALT TWO agreement. The analyses were performed on large scale strategic exchange computer models using the best projections of the characteristics and capabilities of U.S. and Soviet forces.

Most of the analyses deal with damage to the Soviet Union. It should be noted, however, that comparable damage would occur in the U.S. Comparisons of U.S. and Soviet damage are made in a number of pertinent places. All the analyses assume a Soviet first strike against U.S. strategic forces, other military targets and industry; followed by a U.S. retaliation with its surviving forces (except for a reserve) against a similar set of Soviet targets.

The following topics are addressed in this paper:

- Overview of the Soviet civil defense program;
- Vulnerability of U.S. and Soviet civil sectors;
- Attack scenarios;
- Effect of attacks on Soviet industry;
- Industrial hardening;
- Human fatalities from attacks;
- Other factors.

II. Soviet Civil Defense

The Soviet Civil Defense Program* is a substantial program which has been ongoing for over 30 years. It is a military controlled organization, estimated to consist of over 100,000 full-time civilian and military personnel. The cost of this program in 1976 has been estimated at about 400 million rubles, which represents less than 1 percent of the estimated Soviet defense budget. While 400 million rubles equates to approximately $500 million at the official rate of exchange, a

* See detailed description in "Soviet Civil Defense," Central Intelligence Agency, NI 78-10003, July 1978.

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parallel program would be much more expensive to duplicate in the U.S. because it is highly labor intensive. The cost of 100,000 civil defense workers alone would be on the order of $1.5 billion in the U.S., and the total cost of a duplicate program in the U.S. would be about $2 billion.

The Soviet civil defense organization has published several books and manuals, a number of which have been translated into English by U.S. agencies. These publications as well as other open source references to the Soviet civil defense program depict a system which is broad in scope and devoid of gaps, in conceptual terms. An assessment based wholly on Soviet literature would greatly overestimate the reality as well as the effectiveness of the system.

The most tangible aspect of the Soviet civil defense program is the presence of hardened underground shelters. At the present time the Soviets are believed to have blast shelters for most of their leadership. In-place protection is estimated to be sufficient for 10 to 20 percent of their urban population, based on a shelter space allowance of 1.0 and .5 square meters of floor space respectively. ACDA believes that $.5M^2$ is unrealistic due to the expected extended shelter stay times that would be required. Note that $.5M^2$ is equivalent to a square that is only 28 inches by 28 inches.

The Soviets have developed plans for evacuation of the urban areas. These plans consist of transporting the urban population by rail, motor vehicles or on foot to relocation sites in rural areas. In the rural areas the urban population is to be housed with rural hosts and to be protected from fallout by upgrading the protection of existing buildings or by the construction of expedient shelters. Although the Soviet Union has never tested a large scale city evacuation, it was assumed in the analysis presented here that 80% of the urban population could be evacuated.

The Soviet Union has plans for the protection of industry. Despite these plans, however, there is little evidence of industrial dispersal or hardening. The reason for this lack of action is undoubtedly the huge cost and limited effectiveness of such measures. The only major Soviet accomplishment in the industrial protection area is the building of shelters for part of the work force. In addition, there is a program for the training of civil defense workers.

III. Comparison of U.S. and Soviet Targets

An issue that often arises in comparing the U.S. and the Soviet Union is the question of whether the Soviet Union, because of its large land area, has an inherent advantage over the United States. In order to investigate this issue the question of whether population and industry are more dispersed in the Soviet Union than in the United States was addressed.

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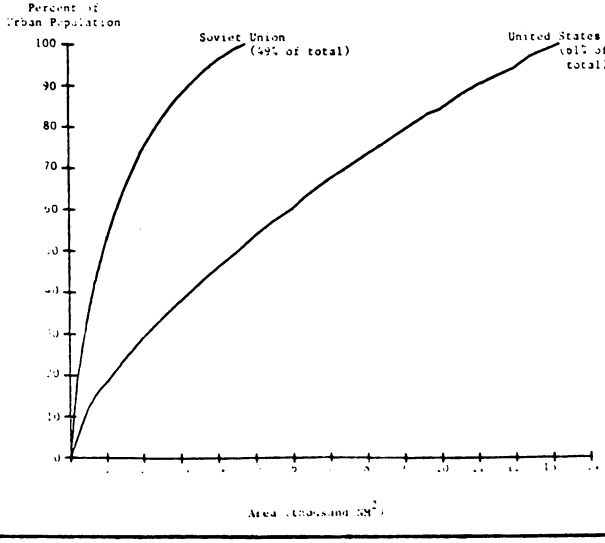
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Figure 1 compares the distribution of the urban populations by land area. This figure was constructed by taking the urban population (that is, the people that live in cities of 25,000 or larger) and cumulatively adding each residential district* from the largest one to the smallest one; then plotting the percent of the urban population as a function of the area of these districts. As can be seen from the figure the Soviet urban population lives in an area of less than 5000 NM^2, while the U.S. urban population lives in an area of about 14,000 NM^2. Clearly Soviet cities are more densely populated than are U.S. cities. This result is not surprising given that the Soviet urban population lives mostly in apartment houses while in the U.S. the private home is more common.

FIGURE 1

Distribution of Urban Population
According to Land Area

U.S. urban population: 131 million
S.U. urban population: 126 million



* The methodology used did not include non-populated urban areas such as commercial districts, rivers, lakes or large parks. Thus, total land area used in this comparison is less than the computed area based on city limit dimensions.

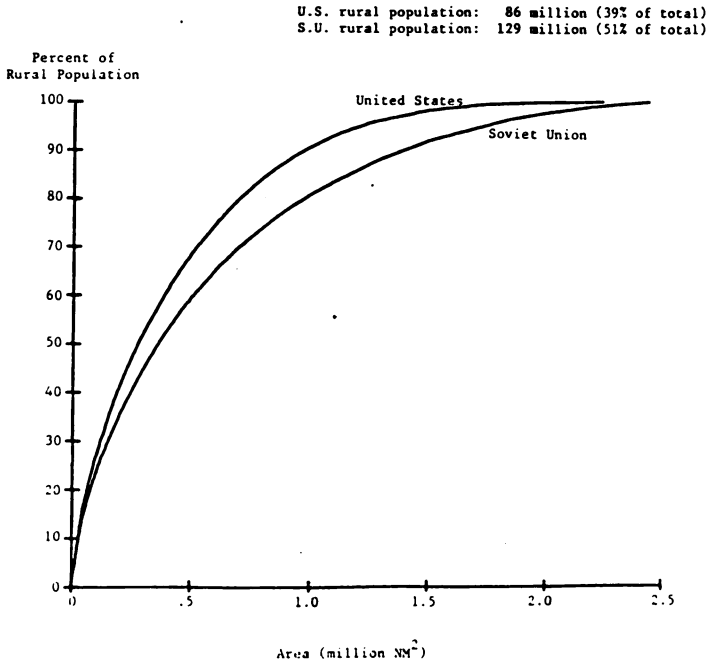
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Figure 2 compares the distribution of the two rural populations by land area and indicates that the U.S. and Soviet rural population each live in an area of 2 to 2.5 million NM^2. Therefore, despite the fact that the Soviet land mass is considerably larger than the U.S. land mass, the rural populations of the two countries live in areas of similar size.

FIGURE 2

Distribution of Rural Population
According to Land Area

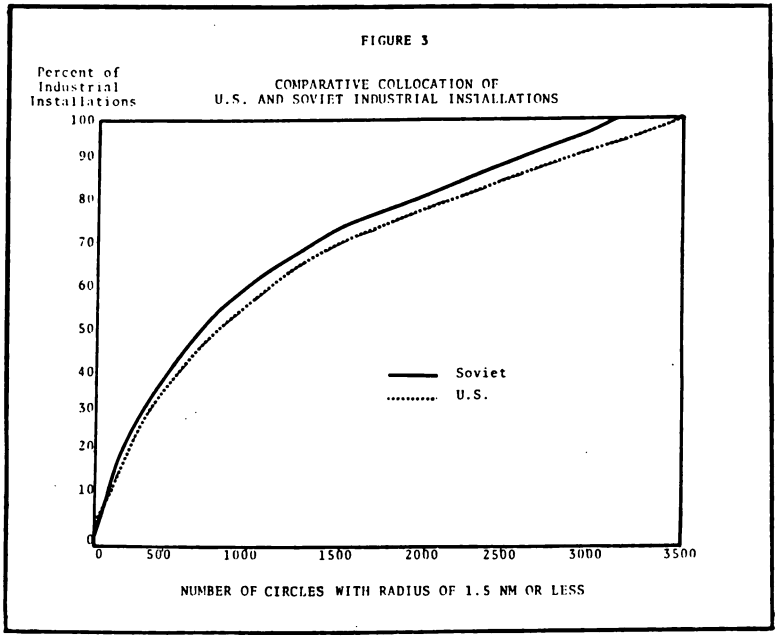


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Figure 3 compares the collocation of industrial establishments. This figure was derived by computing the minimum number of circles with a radius of 1.5 NM* necessary to encompass all of the industrial installations in each country. The circles were then accumulated from the largest to the smallest (in terms of the numbers of industrial facilities enclosed within each circle) to form the curve shown. An inspection of this figure readily shows that the industrial concentrations in the U.S. and the Soviet Union are similar. Another interesting observation that can be made from this figure is that approximately 1300 of these circles (i.e., weapons) are sufficient to cover 70% of the industrial installations in either of the two countries. A more detailed analysis of Soviet industry shows that, in fact, key industries have more than half of their production in less than 200 plants. These facilities produce primary metals, chemicals, petroleum, construction equipment, agricultural equipment, railroad equipment, synthetic rubber and electric power generators.

FIGURE 3



* The destructive radius of a medium sized nuclear weapon against a soft target.

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Figure 4 compares the collocation of population with industry. An inspection of this figure shows that the Soviet population lives closer to industry than does the U.S. population. This result stems from the fact that the U.S. has a more widely dispersed urban population and a large number of private automobiles which permit workers to live further from their work.

FIGURE 4

COLLOCATION OF POPULATION WITH INDUSTRY
(PERCENT OF POPULATION)

PERCENT OF POPULATION LIVING WITHIN:	U.S.	S.U.
1.0 NM	9%	16%
1.5 NM	22%	31%
2.5 NM	45%	40%
5.0 NM	68%	52%

In conclusion, the answer to the question, "Does the Soviet Union have an inherent advantage over the U.S. because of population and industrial distribution?" is clearly "no."

- Urban density is greater in the Soviet Union.
- Rural density in both countries is similar.
- Industrial concentration in both countries is similar.
- Population collocation with industry is greater in the Soviet Union.

IV. Attack Scenarios

A number of attack scenarios were analyzed using the strategic forces projected for the U.S. and the Soviet Union under a SALT TWO agreement. In all scenarios it was assumed that the Soviet Union conducted a first strike against U.S. strategic forces (i.e., ICBM silos, ballistic missile submarine bases and bomber bases), other U.S. military targets, and U.S. industry. The U.S., having lost the bulk of its ICBM force, its submarines in-port and its non-alert bombers would then retaliate against a similar set of Soviet targets. In all but a few scenarios, which will be discussed later, the U.S. held back a reserve force of 10 to 15% of its surviving warheads.

Two different force postures were examined; the first assumed a day-to-day status and the second placed forces in a generated condition. The day-to-day posture is the normal alert posture for strategic forces. The generated posture simulates the alert readiness which would occur in times of tension. Certainly if the Soviet Union implemented its civil defense posture, the warning this action would provide would result in U.S. strategic forces being placed on generated alert.

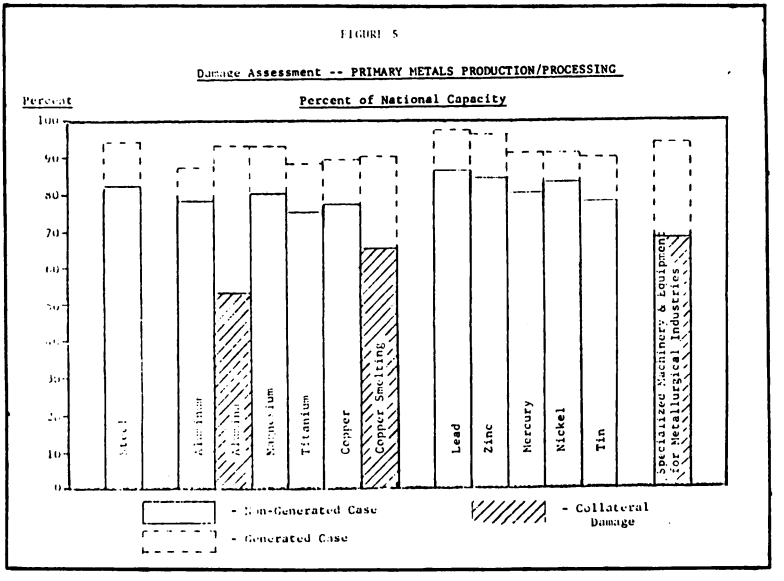
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The results presented deal primarily with damage to the Soviet Union from the U.S. retaliatory attack. However, it should be noted that damage to the U.S. would be of similar magnitude. Furthermore, if the forces were larger than those projected under SALT TWO and/or if the U.S. were to strike first, the damage to the Soviet Union would be greater.

V. Effect of Attack on Soviet Industry

The effect of the U.S. retaliatory attack on Soviet industry was evaluated at the 10 psi level. That is, industrial facilities were assumed to be destroyed if they were subjected to overpressures of 10 pounds per square inch or more. This amount of overpressure is equivalent to wind blast of 600 miles per hour or more. In actual fact, most industry is softer than 10 psi. Furthermore, this is only the damage caused by blast and does not take into account the damage caused by other effects, particularly fires, which could be expected to cause complete burnout in areas exposed to somewhere between 3 and 5 psi.

Figure 5, for example, shows the percent of the total Soviet production capacity of primary metals that was destroyed in the simulated attacks. The



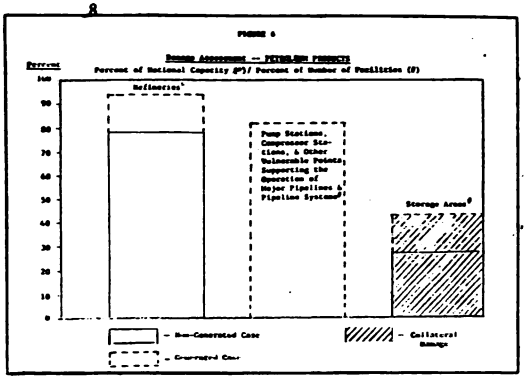
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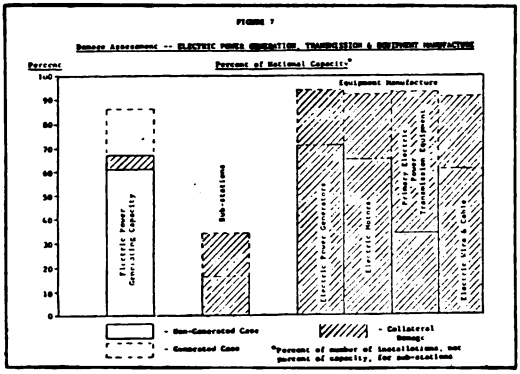
figure shows these results for both the day-to-day (non-generated) and the generated force postures. In addition the figure shows collateral damage to industrial facilities that were not targeted but which received damage because of their proximity to targeted facilities.

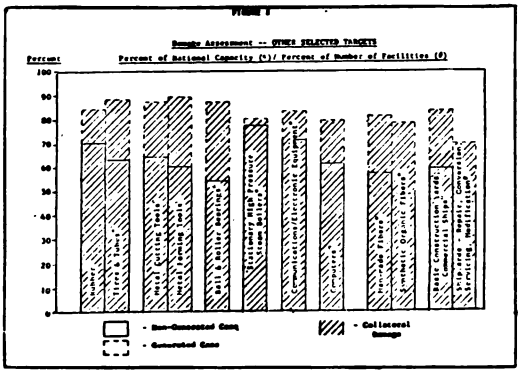
Figures 6, 7 and 8 show similar results for petroleum products, electric power generation and an assortment of other selected industries. Other industrial categories received similar damage.

In summary this representative U.S. attack on industry caused:

- 65 to 70 percent destruction of key Soviet production capacity from U.S. forces in normal day-to-day alert status;
- 85 to 90 percent destruction of key Soviet production capacity from a generated U.S. force status;
- 60 percent collateral damage to non-targeted Soviet production capacity from normal alert;
- 80 percent collateral damage to non-targeted Soviet production capacity from generated alert.







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VI. Industrial Hardening

The question of hardening industrial plants and equipment has been raised at various times. In considering this question it is necessary to consider three factors; first, the range at which nuclear weapons can generate overpressures; second, the fact that overpressures can be greatly increased by setting off the explosions at lower altitudes; and finally, how much overpressure can be withstood by plant and equipment. On this last point it should be noted that, even at immense cost, we do not find it possible to build missile silos to sufficient hardness to withstand the overpressures of modern nuclear weapons delivered with high accuracy.

To illustrate the effect of blast overpressure, Figures 9 and 10 show the structural damage, respectively, to a brick house subjected to 5 psi overpressure at the Nevada Test Site and to the Mitsubishi steel plant at Nagasaki after subjected to 6 psi overpressure. Clearly these pictures show the destructive effect of 5 to 6 psi.

As noted earlier, in this analysis damage was measured at the 10 psi level and the weapons used against industry were detonated at heights of burst to optimize the size of the 10 psi overpressure effect. In order to investigate the potential effect of some industrial facilities being hardened, an analysis was made of the effect of detonating the weapons at low altitudes. This analysis showed that, with ground burst, the 10 psi damage level presented earlier would be reduced by 5 to 10 percent but that the overpressure over the center of the target area would be greatly increased.

FIGURE 9

STRUCTURAL DAMAGE FROM AIR BLAST

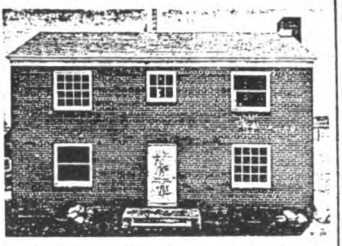


Figure 5.29. Unreinforced brick house before a nuclear explosion, Nevada Test Site.

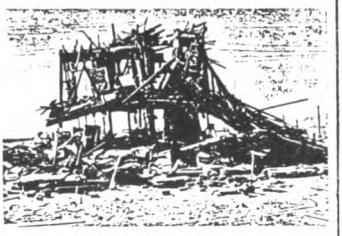


Figure 5.30. Unreinforced brick house after a nuclear explosion (5 psi overpressure).

Figure 10

Industrial Damage at 6 psi Overpressure



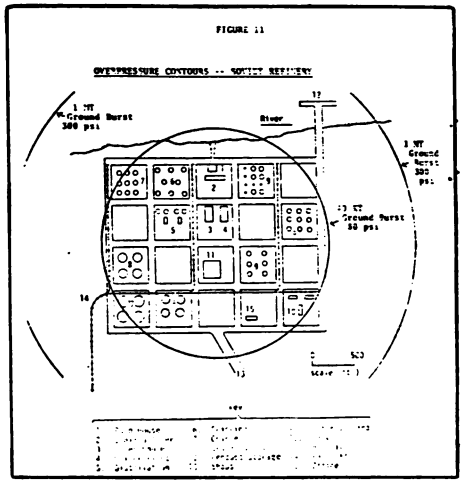
Machine Shop at Mitsubishi Steel and Arms Plant - Nagasaki, Japan - August 1945

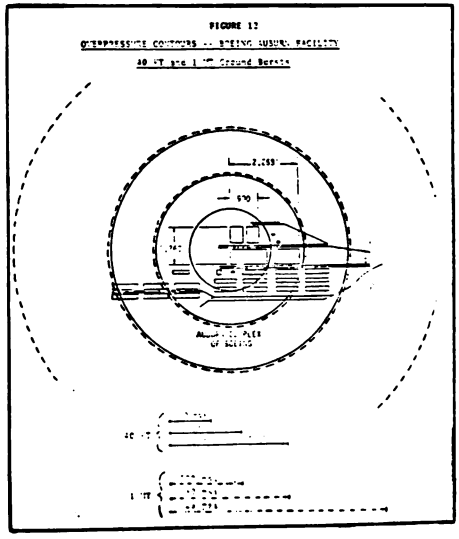
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Figure 11 shows 40 kiloton and 1 megaton nuclear weapon ground bursts over a Soviet refinery. It can be noted in this figure that the 40 KT weapon creates an 80 psi overpressure over the entire facility, and that the 1 MT weapon creates a 300 psi overpressure circle much larger than the facility. Figure 12 presents a similar display for a very large U.S. plant, the Boeing Auburn facility. It can be noted that a 1 MT weapon covers the entire facility with 80 psi of overpressure, while a 40 KT weapon covers it with 10 psi. A 40 KT weapon detonated at the center of this facility would therefore result in 100% damage expectancy, if accuracy of weapon delivery is taken into account the damage expectancy to this large plant would be 90% from the effects of blast alone. Fires and other effects would of course cause additional damage.

In addition to the capability to detonate weapons at low altitudes is the fact that the new weapons that are entering the U.S. inventory in the 1980s will create larger overpressures. New U.S. SLBMs will create approximately 50% higher overpressures than current SLBMs and the ALCM will roughly triple the overpressure of





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our current SLBM. Clearly it is much easier to introduce more effective weapons to overcome attempts at hardening than it is to harden industrial plants and equipment.

In summary we conclude that attempts to harden above-ground facilities is a futile exercise, and that even buried facilities which are targeted cannot survive. Selected pieces of equipment could be expediently hardened to improve survival in peripheral areas; however, hardening machinery in targeted facilities would be of little use. Any attempt to harden can be easily overcome by detonating weapons at lower altitude with only a minor reduction in the 10 psi destruction capability. Future U.S. weapons would offset 1½ to 3 fold increases in hardness even if such increases could be physically and economically accomplished.

VII. Human Fatalities From the Attacks

As noted earlier the attacks were directed against strategic forces, other military targets, and industry. The population was not attacked directly but an evaluation was made of collateral damage to population. The fatalities reported in this section refer only to those occurring from blast, radiation, and short term fallout effects. Over a longer period many additional fatalities would occur.

Figure 13 presents U.S. and Soviet fatalities for the generated and non-generated attacks under various civil defense postures. The first row, "No civil defense," represents the results for people in their normal activities around their homes. In this case U.S. fatalities would be 105 to 130 million, and Soviet fatalities 80 to 95 million. The second row, "In-place protection," represents a posture where the population takes protection in the best available shelters but does not evacuate urban areas. While this posture reduces the fatalities by about 20% in the non-generated case, it should be noted that the generation of the strategic forces offsets these reductions. The third row, "In-place protection with urban evacuation," assumes that 80% of the urban population evacuates the

FIGURE 13

Fatalities from Attack on Counterforce, Other Military Targets and Industry (millions)

	U.S. Fatalities		Soviet Fatalities	
	Generated	Non-Gen.	Generated	Non-Gen.
No Civil Defense	N/A	105-131	N/A	81-94
In-Place Protection No Evacuation	107-126	76- 85	80- 88	60-64
In-Place Protection With Urban Evacuation	69- 91	N/A	23- 34	N/A
In-Place Protection With Urban Evacuation (Direct Population Attack)	87-109	N/A	54- 65	N/A

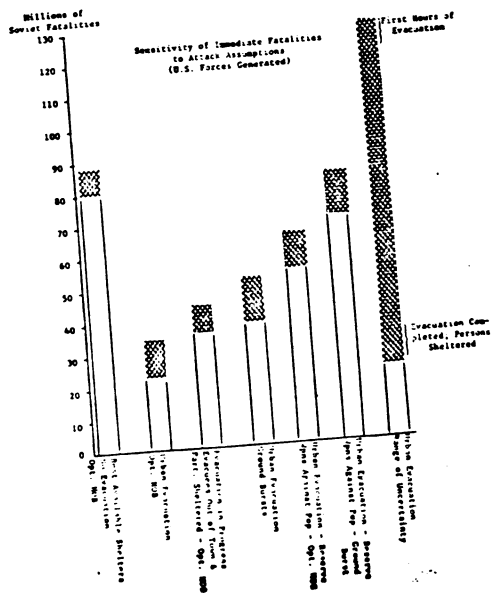
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cities to ranges up to 150 km and that the remaining 20% take protection in the best available shelters. The evacuated people are located with the rural population, and both the evacuees and rural people go to the best available rural shelters and build hasty shelters. This posture represents an immense civil defense effort and no analysis was made to determine the feasibility of implementing such a posture. In fact it is highly questionable whether the U.S. or the Soviet Union could effectively achieve this posture, which would result in substantial reductions in fatalities. The fourth row presents a civil defense posture similar to the third row, but the attacks include the use of the residual weapons to directly target the evacuated population. As can be noted, directly targeting evacuees substantially increases the fatalities from the short term effects of nuclear war.

In Figure 13 U.S. fatalities are higher than Soviet fatalities. There are two primary reasons for these results which are unrelated to civil defense. First the analyses were based on Soviet first strikes which caused losses to our strategic forces; a U.S. first strike would obviously have resulted in many more weapons down on the Soviet Union. Second, the Soviet Union has higher yield weapons which result in more fallout. Finally the Soviet Union's better shelter program also makes a minor contribution to this difference.

A more detailed analysis of Soviet population losses is shown in Figure 14. The first two bars represent the "No civil defense" and urban evacuation case

FIGURE 14



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shown earlier. The third bar shows the fatalities that would occur if the U.S. attack were initiated when the Soviet evacuation is about half completed. The fourth bar is the urban evacuation case shown earlier, but with a U.S. attack in which all weapons are ground burst. This ground burst attack, as noted earlier, would reduce the industrial damage by 5 to 10 percent but would create much more fallout. The fifth bar is the evacuation case with the reserve U.S. weapons used against the evacuated population that was shown on the previous chart. The sixth bar represents the same case as the fifth bar, except that all U.S. weapons are ground burst. This case is important because it shows a fatality level that the U.S. can impose even if the Soviet Union is totally successful in carrying out its evacuation and shelter protection plans. As can be noted, in this case U.S. strategic forces can cause 70 to 85 million fatalities from the short-term nuclear effects alone. Finally, the last bar shows the wide uncertainty associated with evacuation. If the attack were to occur during the early hours of evacuation the fatalities would be even higher than in the no civil defense case. As the evacuation progresses, the fatality levels would decrease.

In summary, the effectiveness of civil defense in protecting population is primarily a function of the level of force generation and urban evacuation. The survivability of the population is not significantly increased by in-place shelter protection. The results are sensitive to a variety of other factors such as the protection levels assumed; whether weapons are ground or air burst; how many people evacuate, how far they go, where they go and what they do when they get there; and finally, whether the evacuated population is targeted.

An observation can now be made with respect to civil defense. The results indicate that evacuation can significantly reduce the fatalities resulting from the short-term effects of nuclear war. However, a number of questions arise:

- Can evacuation be implemented?
 - It probably can with or without an evacuation plan.
 - It would undoubtedly result in utter chaos. A good evacuation plan might somewhat reduce the level of chaos.

- Who is better equipped for evacuation?
 - The U.S. with one car for every two citizens and a vast highway system? or
 - The Soviet Union with a plan but limited transportation?

- The real problem is sustaining the evacuated population; who is better equipped for sustaining the evacuees?
 - The U.S. with large surpluses of goods and food and many non-urban housing facilities? or
 - The Soviet Union with chronic shortages, limited distribution capabilities, and limited non-urban housing?

Finally, it should be kept in mind that, while no one has practiced evacuation, on every major holiday approximately 50 million Americans "evacuate" their homes and travel to resort areas. The Soviet Union has no comparable capability.

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VIII. Other Factors in Nuclear War

The damage reported so far in this paper refers only to the short-term effects of nuclear detonation on industry and people. There are, however, many other effects of nuclear war, some of which are discussed in this section.

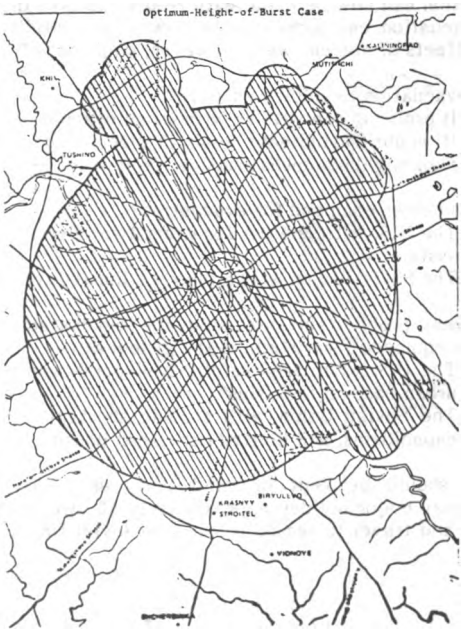
A. Effect of Nuclear War on Cities. In order to examine the effect of nuclear war on cities, a detailed analysis was made of the results of the simulated attacks on Moscow. In this attack approximately 60 warheads went down within the Moscow city limits. Such an attack represents about 1400 times as much megatonnage and 300 times as much equivalent megatonnage (EMT) as went down on Hiroshima and Nagasaki in 1945. Peak overpressures throughout the downtown Moscow area were so severe (over 100 psi) that not a building or tree would remain standing. Clearly these attacks are orders of magnitude larger than the Hiroshima and Nagasaki bombings.

Much of the damage to cities, however, does not just come from blast overpressures; secondary fires would also be a significant factor. Generally, it is estimated that total fire burn-out would occur to the 3 to 5 psi levels. Figure 15

FIGURE 15

5 PSI OVERPRESSURE CONTOURS-MOSCOW

Optimum-Height-of-Burst Case

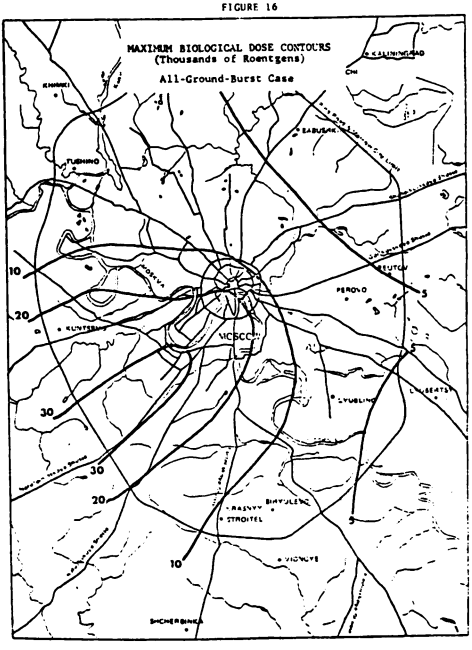


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shows the 5 psi overpressure contour that would occur from this simulated attack on Moscow. This figure shows that the burn-out area would cover 85 to 90% of the total urban housing. This estimated burn-out area does not assume that a "fire storm" would occur, but it is based on an estimate that fires once started could not be fought because of the intense radiation environment and the fact that the water supply would be destroyed.

Figure 16 shows radiation dose contours over the city in thousands of roentgens. Almost the entire city is covered by more than 5000 roentgens and, in some parts of the city, the dose is above 30,000 roentgens. To understand the magnitude of this radiation, one must keep in mind that only doses of 100 roentgens or less can be absorbed by human beings without serious consequences. Such a dose will not create illness, although it will substantially increase the risk of cancer and other diseases. A dose of 200 roentgens will cause incapacitating radiation sickness to 50% of the people exposed to it, and a dose of 450 roentgens will cause 50% fatalities to the people exposed to it. Clearly, no

FIGURE 16



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human being exposed to the kind of radiation dose that would exist in Moscow could survive unless he was well sheltered.

Lest one believes that Moscow is a special case, Figure 17 demonstrates that other Soviet cities would be exposed to similar levels of damage. In this figure, the number of warheads and the amount of EMT per million people is

FIGURE 17

WEAPONS AND EMT ARRIVING IN RELATION TO URBAN POPULATION

(WEAPONS DOWN WITHIN 10 NM OF CITY CENTERS)

TEN LARGEST SOVIET CITIES	PER MILLION POPULATION: NUMBER OF WARHEADS	PER MILLION POPULATION: AMOUNT OF EMT
1. MOSCOW	8.8	2.99
2. LENINGRAD	11.4	2.99
3. KIEV	8.9	1.97
4. TASHKENT	9.6	2.58
5. KHARKHOV	14.1	4.02
6. GORKIY	11.4	3.98
7. NOVOSIBIRSK	12.1	4.08
8. BAKU	11.7	3.30
9. SVERDLOVSK	16.6	4.43
10. MINSK	20.8	6.80
AVERAGE (EXCLUDING MOSCOW)	12.3	3.52
NEXT 40 LARGEST CITIES (AVERAGE)	14.4	5.45
NEXT 150 LARGEST CITIES (AVERAGE)	25.7	8.21
200 LARGEST CITIES (EXCLUDING MOSCOW (AVERAGE)	19.1	6.33

shown for the next 200 largest Soviet cities. It can be noted that the other cities were attacked at least as intensively as Moscow was. Actually the total attack was even greater than shown in this figure because, in addition to these 200 cities, 450 out of the next largest 600 cities were also attacked. In all 80% of all Soviet cities and towns with populations of 25,000 or more received at least one weapon. Keep in mind that cities per se were not targeted; these cities were attacked because they contained the military and industrial facilities that were targeted.

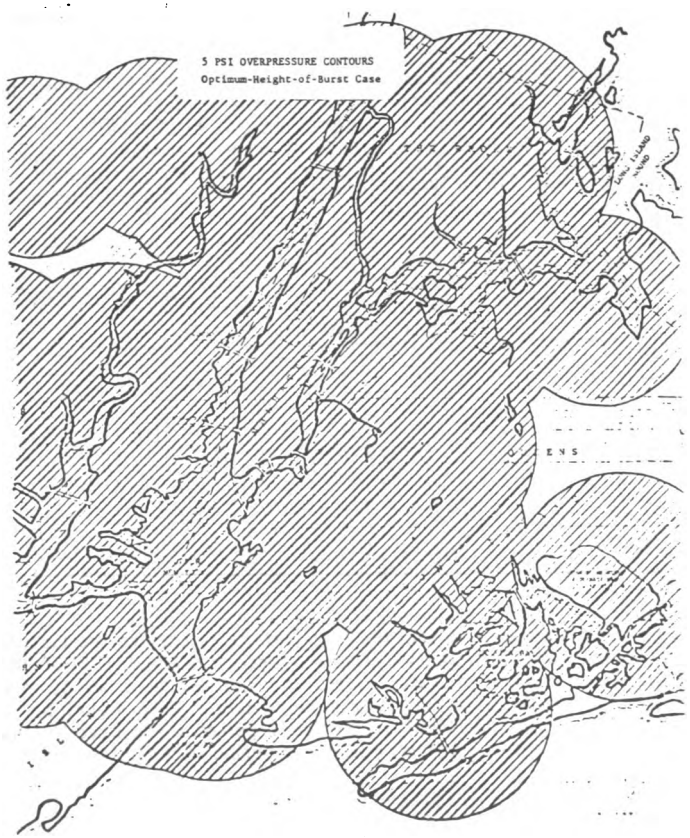
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17

Finally, it should be understood that similar devastation would occur in the United States. Figure 18 illustrates the 5 psi (total burn-out) area that would occur in the greater New York City area. Clearly the cities of both countries would be devastated.

B. What About Shelters? An analysis was made of the survival potential of people in shelters in the Soviet urban areas. Soviet civil defense manuals specify that shelters are built to a hardness of 14 to 28 psi. There has been some

FIGURE 18



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debate in the U.S. about whether these shelters are harder than these specifications. In this analysis we assumed that the Soviet urban shelters were 50 or 100 psi hard. Figure 19 gives the fatalities and casualties for people in the shelters during the attacks simulated in these analyses. If the shelters are 100 psi hard, 20% of the occupants would be killed and 40% injured, for a casualty rate of 60%; if the shelters are 50 psi hard, then 30% of the occupants would be killed and an additional 60% injured, for a casualty rate of 90%.

FIGURE 19

INJURED AND KILLED IN URBAN SHELTERS NEAR INDUSTRIAL PLANTS

	Killed	Living Injured	Total Casualties
In 100 PSI Blast Fallout Shelters	20	40	60%
In 50 PSI Blast Fallout Shelters	30	60	90%

LACK OF MEDICAL CARE WILL INCREASE KILLED BY ABOUT 10% IN 30 DAYS
MANY SURVIVORS WILL BE MAIMED

Now consider people in shelters that manage to survive the blast and fire effects. Someone located in a shelter with a protection factor (PF) of 100 would, in the southeast corner of Moscow, still be exposed to doses of more than 30,000/100 = 300 roentgens. Actually a much larger dose would be received because, to obtain the full 100 PF protection, a person would have to stay in the shelter until the radiation level has decayed, a period that can last for several

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months. Figure 20 shows two shelter-use patterns that illustrate the difficulty of radiation avoidance even in excellent shelters. Note that even in a highly protective shelter with a PF of 500, if an occupant stayed 100% of the time in the shelter the first month after the attack and 75% of the time in the shelter during the second month of the attack, 30% of the urban area would be too "hot" for this kind of a regime—that is, he would have to stay in the shelter for an even longer period. In the second pattern illustrated occupants leave the shelters for 2% of the time during the first months; in this case 60% of the urban area is too "hot" for this regime. Any lesser shelter stay time would of course make this situation even worse.

Another factor to be considered is reentry to the urban areas by people that have not been exposed to any radiation. The first problem would be to find such people, since 80% of the total Soviet population (including the evacuated population) is located in areas that are exposed to 100 or more roentgens. Even people that have received no dose at all would have to wait one month to reenter half the urban areas, two months to reenter three quarters of the urban areas, and up to six months to reenter the entire urban area.

C. Food and Water Supplies. Stock requirements of food and water would vary from one week to several months depending on the fallout pattern. Furthermore, destruction of the transportation nodes would delay redistribution of supplies by two months or more. Stocking two months of supplies is a major problem. Undoubtedly many survivors would have to leave shelters prematurely to obtain supplies and would be exposed to radiation.

D. Medical Care. In addition to the fatalities presented earlier in this report, it is estimated that there would be 30 to 50 million injured. The care of these injured people would be an immense problem and many would die. Hospital and medical facilities would be very scarce, for example, in the generated attack

FIGURE 20

EFFECT OF USE PATTERN

SHELTER EFFECTIVENESS
TO AVOID RADIATION ILLNESS (100 REM)

SHELTER USE PATTERN			NEAR PERFECT SHELTER PF = 500	GOOD SHELTER PF = 40	BASEMENT PF = 10
FIRST MONTH	SECOND MONTH	THEREAFTER			
100 % IN SHELTER	75% IN SHELTER 25% INDOORS	75% INDOORS 25% OUTDOORS	30% OF URBAN AREA DENIED	65% OF URBAN AREA DENIED	80% OF URBAN AREA DENIED
98% IN SHELTER 2% OUTDOORS	75% IN SHELTER 25% INDOORS	75% INDOORS 25% OUTDOORS	60% OF URBAN AREA DENIED	70% OF URBAN AREA DENIED	85% OF URBAN AREA DENIED

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80% of the urban hospitals in the Soviet Union were destroyed (93% of the Moscow hospitals were destroyed). Hospitals, of course, were not attacked; they are, however, located near many of the military and industrial facilities that were targeted.

In addition to the large number of injured people, there would be a large increase in disease due to poor sanitation, crowded living conditions ($\frac{1}{2}$ to 1 square meter per person in shelters), shortage of food and medical supplies, and reduced resistance to disease due to radiation exposure.

In summary, the number of injured and sick people would be at least an order of magnitude larger than in any previous war.

E. Agriculture. An estimate was made of the effect of these nuclear attacks on agricultural crops. The results are sensitive to the time of the year the attack occurs. If the attack takes place during the growing season, then up to 30% of the crops could be lost. On the other hand, if the attack is in the winter the effect on crops would be minor. A considerable amount of uncertainty surrounds these estimates. It seems that crops would not be too seriously affected, yet we find that on Bikini Island 25 years after the completion of our nuclear tests, crop contamination problems still exist.

The situation with livestock is much more serious. Over half of the grazing animals would die and over one quarter of large farm animals fed on stored food would die.

The above damage to agriculture is estimated only from the effects of blast and fallout; it does not take into account the potential effect of "ozone" depletion and other potential climatic changes.

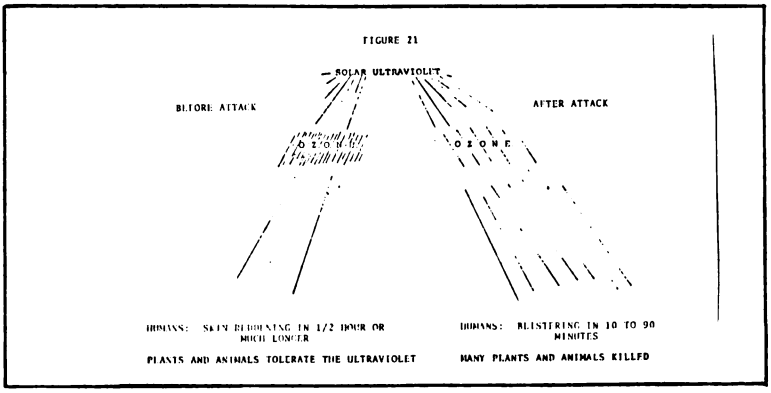
F. The Ozone Problem. A considerable amount of uncertainty is associated with estimating the effects of nuclear war on the ozone layer. Even greater uncertainties exist when considering long term climatic and genetic changes. Many of these effects were studied by the National Academy of Science*. In this analysis the estimates produced by the National Academy of Science were translated to the attacks conducted in this simulation.

* "Long-Term Worldwide Effects of Multiple Nuclear-Weapons Detonation," National Academy of Science, Washington, D.C., 1975.

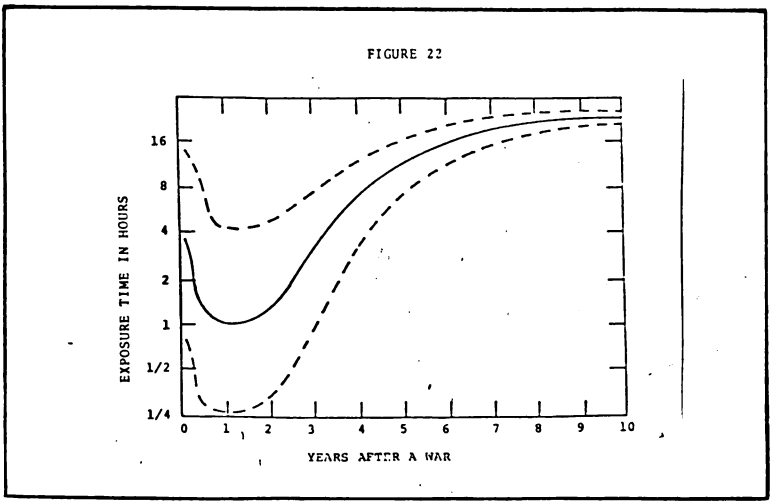
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Figure 21 is a sketch which illustrates the effect of depletion of the ozone layer. Before the attack, exposure to the ultraviolet rays of the sun can produce



a nice sunburn after exposure of ½ to 1 hours; after the attack such exposure would produce blistering burns on the body. Plants and animals of course would be subject to similar increases in ultraviolet rays and many would be destroyed. The most serious aspect of the depletion of the ozone layer is illustrated in Figure 22. This figure shows that the worst depletion occurs one year after the attack and that the ozone layer does not return to its normal stage for a period of 6 to 7 years. Considering that this effect would cover the entire northern hemisphere of the earth, it represents a very serious factor. Reduction of the ozone layer in the southern hemisphere would be a less severe, but not an inconsequential, problem.



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G. Summation of the Effect of Other Factors

— Soviet urban areas would be virtually leveled by a U.S. retaliatory attack.

— Those who stayed in urban areas, even in hardened shelters, would have serious survival problems:

- Blast effects would kill many.
- Many more would be seriously injured, with limited prospects for medical treatment.
- Radiation would deny safe departure from shelters for weeks or months; yet food and water shortages would force many to leave shelters prematurely.

— Radiation damage to agricultural crops would probably not be serious, but damage to livestock would be.

— Those who survived all these obstacles would still face the specter of an ozone depletion problem that could effectively prevent daytime outside activity for several years, and could destroy all but the most resistant crops and livestock.

IX. Conclusions

— The fatalities and industrial damage presented in this report represent only a part of the total disaster of a massive nuclear war.

— Many of these effects are difficult to measure and simulate on computers; nevertheless, they are real factors which must be considered.

— While some civil defense activities, such as evacuation, have some effect on the immediate post attack environment, their benefits in the long run have not yet been established.

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APPENDIX 2

Survey of Population Evacuation Plans

In December 1978, a questionnaire was sent to the mayors of the twenty most populous cities in the United States requesting information on population evacuation planning. Questionnaires were sent to mayors of Phoenix, Arizona; Los Angeles, California; San Francisco, California; Washington, D.C.; Miami, Florida; Honolulu, Hawaii; Chicago, Illinois;[1] Indianapolis, Indiana; New Orleans, Louisiana; Baltimore, Maryland; Boston, Massachusetts; Detroit, Michigan; New York, New York; Philadelphia, Pennsylvania; Memphis, Tennessee; Dallas, Texas; Houston, Texas; San Antonio, Texas; and Milwaukee, Wisconsin.

Responses were received from 19 of the 20 cities. In addition, responses were received from 26 states, counties, cities and organizations which were not sent the questionnaire.

Copies of the letter, questionnaire, and responses follow:

[1] Response not received at date of publication.

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APPENDIX 2A

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, D.C., December 18, 1978.

The Hon. FRANK L. RIZZO,
Mayor of Philadelphia,
Philadelphia, Pa.

DEAR MAYOR RIZZO: On January 8, the Senate Committee on Banking, Housing, and Urban Affairs will be holding hearings on various civil defense issues.

In order to compile a background data base, we are requesting that mayors of several large cities assist the committee by providing information on their civil defense programs, specifically on evacuation planning.

It would be appreciated if you would assist us by providing responses to the attached questions by January 4, 1979.

If there are any questions about this request, please contact Willard Holmes (202-224-5653) or Martha Braddock (202-224-2337) of the committee staff.

Sincerely,

WILLIAM PROXMIRE,
Chairman.

QUESTIONS RELATING TO POPULATION EVACUATION OF METROPOLITAN AREAS

1. Do you now or have you ever had a population evacuation plan for your city? If so for what purpose?
2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.
3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?
4. What division or office in your city government is responsible for population evacuation?
5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials?
6. To what extent are federal, state and local governments included in your program planning?
7. What financial resources were used to develop your population evacuation plan?
8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?
9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?
10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?
11. What distance will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?
12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?
13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).
14. What are the plans for reuniting separated family units?
15. What provisions are made for protection of property during and after the evacuation?
16. What nuclear radiation fall out protection is provided in the host area?
17. What percent of the population covered in your plan has designated shelter areas?
18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

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19. As Mayor of one of the larger cities having to deal with transportation related problems—

(*a*) Do you think population relocation is feasible in a crisis situation?

(*b*) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

(*c*) Do you think the problems suggested by the previous questions have a practical solution?

20. The Committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

APPENDIX 2B

CITY OF PHOENIX,
OFFICE OF THE MAYOR,
January 9, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing and Urban Affairs,
U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: Thank you for requesting information regarding the City of Phoenix's civil defense plan.

We have an Emergency Operating Center which, unfortunately, we have had to place in operation twice within the last year due to disastrous flooding of the Salt and Verde Rivers and resulting damages in the City of Phoenix.

The question of population evacuation planning has been carefully considered several times over the past years. Each time it has been concluded by our staffs when working with Civil Defense staff that it is simply not practical or feasible to evacuate the Phoenix Urban area with existing facilities and resources within any reasonable time frame. Key points are the extreme desert heat conditions that prevail during much of the year and the reverse extreme mountain cold that prevails during other parts of the year. Furthermore, there are a very limited number of lanes for traffic outbound from the Phoenix Urban area. During the hot summer even fewer lanes are available that lead to the mountains and not other hot desert areas. I am sure you are aware of the extreme heat conditions in the southwest desert in certain portions of the year and realize that a stalled automobile or a family without water caught in a long traffic tie-up or the lack of other basic necessities could lead to a severe disaster for the evacuees.

Responses to the questions you submitted are on the enclosed pages.

We prefer the alternate of preparing as best we can for defense within our own City, and of course would welcome the Federal and Civil Defense assistance for that purpose that is available. If you have additional questions, please don't hesitate to contact my office.

Sincerely,

MARGARET T. HANCE,
Mayor.

Enclosure.

RESPONSES TO QUESTIONS RELATING TO POPULATION EVACUATION OF THE CITY OF PHOENIX

1. No. (There apparently was one in 1958.)
2. We have an emergency plan for seven basic types of emergencies. None of these plans include evacuation.
3. Not applicable.
4. Not applicable.
5. We review our emergency plans periodically and have only most recently updated both the Emergency Standing Procedures, as well as our Nuclear Defense Plans. This is done in cooperation with our Civil Defense officials. As stated above, they do not include evacuation.
6. Our plan includes coordination with all applicable federal, state, and local Government agencies and officials.
7. Not applicable.
8. Appropriate responsibilities have been assigned to the various departments by the City emergency plans. Further, each department has prepared its own more detailed plan of operation for each of the various types of emergencies.
9. Yes. The City has an Emergency Operation Center which has complete communication ability and adequate fallout protection. It is in the basement of the

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Public Safety building which is the headquarters for the Police Department, and is adjacent to the Communication Center for the Police Department. The EOC itself is not in daily use; however, it may be easily and rapidly converted to emergency use.

10. Not applicable.

11. Distance to appropriate host areas would vary from 100 to 150 to 200 miles. Our plans do not provide for evacuation.

12. Due to the limited number of routes for evacuation and the extreme heat of the deserts during certain times of the year, we do not have plans for evacuation and therefore the City has not calculated the time for such action.

13. Not applicable.

14. Not applicable.

15. Not applicable.

16. Information not available.

17. We have a complete inventory of all nuclear radiation fallout shelters, which is kept current by the Civil Defense Agency. Furthermore, Civil Defense has the responsibility of securing and training shelter managers and other staff. There is capacity for approximately 40 percent of the population in fallout shelters.

18. Our emergency plans provide for seven different types of emergencies. These are:

1. Civil disturbances.
2. Natural disasters (flood or earthquake).
3. Major conflagration.
4. Enemy attack (including Civil Defense Nuclear Attack Plans).
5. Aircraft emergencies:
 (*a*) Major crash at location other than airport.
 (*b*) Major crash at Phoenix Sky Harbor International Airport.
6. Explosives and hazardous materials.
7. Evacuation of City buildings.

19. (a) No.

(b) No, with existing facilities (both transportation and host area) and resources.

(c) Yes. Increased shelter protection capability and increased federal funding for improvement of home shelters.

20. As previously stated, we wish to emphasize the impracticality of evacuation at this time.

CITY OF LOS ANGELES, CALIF.,
March 1, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing and Urban Affairs, Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: I am pleased to be able to assist you in your hearings on Civil Defense issues. The City of Los Angeles has had several occasions in recent months to utilize the planning which the City's Civil Defense organization has developed. These occasions have been ones of natural disaster, but it is my belief that a similar comprehensive planning approach to other emergency possibilities is also to be supported.

Evacuation planning in the City of Los Angeles has mainly concentrated on the dam evacuation program. The Police Department which would implement any evacuation plan, has coordinated development of these plans as part of a State program. The plans are an annex to the City's Organization and Operations Plan which provides basic contingency plans for natural as well as nuclear disasters.

The current evacuation plan was tested during the 1971 Earthquake. At that time, the Van Norman Dam threatened to break, and a large area of the San Fernando Valley, a heavily populated area of the City, had to be evacuated. In three or four hours, approximately eighty-three thousand people were relocated.

All City emergency plans are subject to a two-year review cycle. In addition to this program, a review of plans is done by the State of California Office of Emergency Services and the Federal Defense Civil Preparedness Agency. The emergency preparedness program of the City relies a great deal on coordination with local, state, and federal counterparts in order to maximize the City's ability to respond to the City's needs. During the October 23, 1978 Brush Fire, for example, the City's Fire Department called upon State, County and neighboring jurisdictions for assistance or back-up.

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The duties and responsibilities of the Civil Defense Program within the City are spelled out in a City ordinance which assigns emergency duties to those departments which normally handle the same type of duties on a day-to-day basis. For instance, the Police Department is assigned the emergency law enforcement duties; the Fire Department, emergency safety and rescue operations, et cetera. The City's public utilities are managed by the City's own Department of Water and Power, which is charged in the Ordinance with coordination of public and private utilities in an emergency. The City's Emergency Operating Center provides space during an emergency for liaison personnel from private utilities.

The City's main Emergency Operating Center is located in the Civic Center and has been used several times within the past year to coordinate operations during a local emergency. It is occupied on a day-to-day basis by Civil Defense staff, sections of the Police Department which deal in emergency response, the Fire Department's Operations Control Division, and the 24-hour-a-day City Hall Operator.

Your questions concerning development of a Crisis Relocation Plan encompassing host areas, travel time, transportation modes, and logistical questions are ones which the City will address when direction and financial support for the program is established. I am sure that you can appreciate the magnitude of the problem of planning for relocating the several million people within the City of Los Angeles. No easy solutions can be set down, and the task will require much planning time. However, the physical resources of the area and the City are extensive, and given sufficient financing and guidance, they will be allocated as efficiently as possible to perform the task.

The City of Los Angeles has sufficient shelter spaces available for in-place protection. The City is investigating putting the master list of shelters on the City's computer and then giving wide public dissemination of the locations and capabilities of these facilities.

A population relocation plan for the City would be capable of implementation in any type of major emergency. The City experiences a variety of natural disasters: Floods, mudslides, fires and earthquakes, to name a few. Faced with a truly devastating disaster such as a major earthquake, we might find it necessary to relocate large segments of the population and thus put the plan to use.

Transportation problems could be severe in Los Angeles in a crisis situation. However, the City has extensive networks of streets and highways as well as numerous airports, terminals, et cetera. To the extent that sufficient planning is directed at this element of a Relocation Plan, I am hopeful that a feasible process can be worked out.

The practicality of this planning is difficult to assess. The City has many more immediate problems which command the attention of its officials and personnel. Neverthless, it is my belief that, given the enormity of the destruction possible from a nuclear emergency, relocation planning is a viable contingency plan which should be developed. The City has recently investigated the problem which could arise with the development of increasingly accurate earthquake predictions. The potential problems in this area are also great—what happens to property values, construction activity, et cetera. Despite these questions, the City is moving ahead to develop a contingency plan to use when that situation arises. We will endeavor to do the same with the relocation planning effort.

Very truly yours,

TOM BRADLEY, *Mayor.*

MEMORANDUM

SAN DIEGO, CALIF., *January 4, 1979.*

To: Committee on Banking, Housing, and Urban Affairs.
From: Mayor Pete Wilson, City of San Diego, Calif.
Subject: Responses to Senator Proxmire's questionnaire.

1. The City of San Diego had an evacuation plan during the 1950's for war related emergencies. The "Plan" was never tested. Currently, mass evacuation plans are being considered on a county-wide basis.
2. Consideration of mass evacuation plan will be in all areas of disasters.

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3. Current evacuation plans are in existence for dam failure and flood inundation: these plans have not been tested.
4. All public safety agencies.
5. Current plans are reviewed yearly.
6. All governmental agencies plans interface in the planning process.
7. Normal budget.
8. The City of San Diego's basic emergency plan outlines the various responsibilities and duties.
9. The City has an Emergency Operations Center, as well as four alternate locations. The center possesses communications with all city departments as well as the county, state and federal agencies. The facility is nuclear protected and not utilized except in emergencies.
10. All emergency plans are coordinated regionally, as well as a Crisis Relocation Plan.
11. A survey of the San Diego area was completed approximately one month ago, the data has not yet been analyzed.
12. Evacuation is expected to be accomplished in 3 days or less, based on a 1976 study. Length of habitation in host area is unknown at this time.
13. A study is currently being conducted for food distribution and support.
14. American Red Cross existing plans would be utilized.
15. All public safety agencies.
16. Recent survey data has not been analyzed.
17. Recent survey data has not been analyzed.
18. Dual purpose.
19. (*a*) Population at risk in San Diego area is approximately 1,500,000. Relocation can probably be accomplished in 3 days or less due to excellent local resources and transportation systems.
(*b*) If population at risk can be moved, most lives will be saved even without plans for mass care and feeding. 20%–30% of population would begin to move without direction to do so.
(*c*) Yes, however, it will pose a severe stress on the system.
20. With proper funding and coordination, crisis relocation plans can be accomplished with an obvious savings of life.

OFFICE OF THE MAYOR,
San Francisco, Calif., January 15, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs, U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: This is in reply to your letter of December 18, 1979 with attached questionnaire, requesting information on our civil defense program, specifically evacuation planning.

The State Legislature has given only tentative approval for Crisis Relocation Planning in California, questioning its viability. A review of the matter will be conducted in June, 1979 when a report is made to that body by the State Office of Emergency Services. Further authorization will be dependent on favorable progress.

Several studies have been conducted in the San Francisco Bay Area which conclude that a major natural disaster such as an earthquake will effectively isolate the city because of the vulnerability of the approaches to the Golden Gate and San Francisco-Oakland Bay Bridges.

Evacuation was not considered feasible as a Civil Defense measure back in the early 1950's; it is even less so today with the increase in population in the Bay Area.

Since no mass evacuation is envisioned, no specific plan has been developed for it. However, we have coordinated with the U.S. Coast Guard on the use of small boats in their Emergency Transportation Planning. Our problem is not one of evacuating our own residents, but rather one of evacuating the commuters that may be trapped here should a disaster befall us during the working hours on a week day.

With regard to your questions 19 (a), (b), and (c) it is my sincere opinion that: (a) Relocating mass populations in times of crisis can be accomplished, but only with far better planning and coordinating than has been experienced to date. I do not see crisis relocation as the voluntary initiative it is currently

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planned to be. In my view this could be considered a military question, and as such could not be voluntary; (b) relocation of population is possible as a survival measure only when that population can be sustained and protected. This would require inspired advance planning and vast resources in the host areas—neither of which seems to abound today; and (c) the only practical solution would be in building a stronger, better financed, civil defense to respond to the public needs in times of natural disasters. In so preparing, a better capability will exist for responding to the requirements of a nuclear emergency.

I hope this provides you with the information you are seeking for your deliberations.

Sincerely,

DIANNE FEINSTEIN,
Mayor.

OFFICE OF THE CITY ADMINISTRATOR,
Washington, D.C., January 4, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: On December 18, 1978 you wrote to Mayor Washington requesting information about the District's natural and nuclear disaster evacuation plans. This information is contained in the attached report prepared by the D.C. Office of Emergency Preparedness. The proposed Emergency Operations Plan is being reviewed by appropriate District of Columbia agencies. Statistical research to support a Crisis Relocation Plan is underway. Once the plans are approved by the Mayor, we can make them available to the Committee if you wish.

Please let me know if I can be of further assistance.

Sincerely yours,

JUDITH W. ROGERS,
Assistant City Administrator
for Intergovernmental Relations.

Attachment.

MEMORANDUM

JANUARY 1, 1979,

To: Judy Rogers, Special Assistant for Legislation, Executive Office Emergency Preparedness.
From: Arlene Billings, Acting Director.
Subject: Response to Senator Proxmire's questions.

In accordance with your request of December 21, 1978 I am attaching our response to the questions Senator Proxmire sent to Mayor Washington concerning crisis relocation planning in Washington, D.C.

The responses are based on our limited experience in crisis relocation planning since April, 1977, which is the date on which the city was awarded the first Nuclear Civil Protection planning contract by the Defense Civil Preparedness Agency.

As stated in the responses, we have not yet reached the point in our planning which addresses such critical questions as food redistribution, security of the city, or host area resources.

RESPONSE TO QUESTIONS RELATING TO POPULATION EVACUATION OF THE DISTRICT OF COLUMBIA

1. Do you now or have you ever had a population evacuation plan for your city? If so for what purpose?

Response: The District of Columbia Survival Plan, issued January 15, 1959, contained a detailed evacuation Plan for residents of the District. Evacuation was deemed necessary at that time because the planners found that ". . . adequate shelter against blast, heat or radiation effects of thermonuclear weapons is non-existent within the District of Columbia".

2. Is your Plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your Plan deals with these differences.

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Response: The original "Survival Plan" dealt almost exclusively with evacuation in the event of threatened nuclear attack but recognized that a "major disaster" may necessitate the activation of all or parts of the Plan. A new District of Columbia Emergency Operations Plan is now in the legislative process which will replace the entire Survival Plan. This new Plan defines the role of the departments and agencies of the District Government, private agencies and the Federal Government in all types of disaster situations. It contains volumes on natural disasters, nuclear civil protection, local emergencies, and special events and demonstrations.

3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Response: We have not had a participatory test of the evacuation plan in which citizens were actually directed to move out of the city. Attempts to conduct simulated exercises were unrealistic and could not pin-point deficiencies or stressful situations.

4. What division or office in your city government is responsible for population evacuation?

Response: While the Office of Emergency Preparedness has the overall planning responsibility for evacuation, such a massive movement maneuver would impact on several major agencies including Police Department, Department of Transportation, Fire Department, Board of Education, Finance and Revenue, Department of General Services, and the Department of Human Resources.

5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials?

Response: Our plans dealing with natural disasters and nuclear civil protection are closely monitored by the Federal agencies that provide funding to the city. DCPA and FDAA both require quarterly progress reports which include samples of work products. The Office of Emergency Preparedness works directly with city agencies and department heads in the development of operations plans.

Since the OEP is still gathering the basic statistical data to support crisis relocation planning, we have not yet presented this phase of the overall operations plan to other city officials.

6. To what extent are federal, State and local governments included in your program planning?

Response: Because of the presence of the federal government agencies in the city, any emergency actions plans must be coordinated with them. Our Community Shelter Plan was a joint effort, principally with GSA, in the licensing and stocking of federal buildings in the city. When our Crisis Relocation planning reaches the stage which requires imput from the federal level, we will be working closely with the soon to be established Federal Emergency Management Agency (FEMA).

All of our emergency plans are also coordinated through the Metropolitan Washington Area Council of Governments (COG) as well as with Emergency Preparedness Agencies of Maryland and Virginia.

7. What Financial resources were used to develop your population evacuation plan?

Response: The original Survival Plan, which include evacuation, was produced with federal funds provided for personnel and administrative expenses from the Federal Civil Defense Administration (FCDA).

The present Nuclear Civil Protection planning program is financed by the Defense Civil Preparedness Agency (DCPA) under a 100 percent funded contract with the Office of Emergency Preparedness. The contract is for a one-year period, renewable at the option of DCPA. The first contract for NCP planning was effective on April 1, 1977.

8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Response: The Emergency Operations Plan and the Natural Disaster Recovery Assistance Plan assign duties and responsibilities to all agencies in accordance with their mission as a city entity, and their need to carry on their functions under emergency conditions.

No duties or responsibilities have been assigned as yet for crisis relocation manuevers.

9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Response: Yes, our EOC has been in continuous operation since 1961 and is located on the grounds of the Department of Corrections property at Lorton,

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Virginia. It has complete two-way radio systems with the various D.C. emergency response agencies such as Police and Fire, as well as radio units of PEPCO, Washington Gas, and several Federal Agencies.

Since the Center is inside the prison compound, we have facilities for feeding and sheltering 300–500 persons who may be required to report to the Center during an emergency. Two staff members are permanently assigned to the EOC and the extensive operations area provides ample space for emergency planning activities as well as other administrative functions.

We also maintain the Mayor's Command Center in the District of Columbia to coordinate local emergency actions with the Mayor and other city officials. This office also serves as the main administrative headquarters of the Office of Emergency Preparedness and contains radio and telephone capabilities over a vast city-wide emergency service net. All day-to-day operations are conducted from this Center on a 24 hour per day, seven days per week basis.

10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Response: Yes, the NCP planners have been working with COG, and the planners from Virginia and Maryland since our effort began in 1977. The host areas for the District of Columbia are located in the Shenandoah area of Virginia so we have been gathering statistical data from Virginia on this area. The Maryland planners are coordinating traffic flows with D.C. and Virginia so that jamming and cross-traffic may be avoided in the plans to be developed.

11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Response: A minimum distance of 50 miles and a maximum of 145 miles, with the average distance approximately 80 miles.

The planners have made an initial determination that auto and bus would be the most practical modes of transportation for this area. Families without cars would be provided bus and/or van transportation on a "shuttle" basis to the host areas.

12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Response: We have not made a positive time estimate at this time. We will start with the DCPA planning assumption of 3½ days and see how closely this figure relates to the real time which the NCP planners arrive at after considering all of the actual factors in the District of Columbia.

13. Please discuss your logistical plans for supporting the evacuees (plan for food, water, medicine, sanitary supplies).

Response: We have no accurate data on the host areas as yet on which to begin our logistical planning. Staff from the DC/OEP will make a physical survey of the host areas to determine such things as: existing food supplies and outlets; warehouse space; shelter and lodging capacities in the areas; and capability to provide medical facilities for large numbers of persons.

14. What are the plans for reuniting separated family units?

Response: The prototype plans we have reviewed call for each evacuee to register at a pre-determined "reception center" upon arrival at the host area. A registration form made out in the family name can be used to reunite other family members who register at different times in the reception areas.

We think this is an adequate system for accomplishing the task and would probably consider such a method in our own crisis relocation plan.

15. What provisions are made for protection of property during and after the evacuation?

Response: We have not addressed this phase of the plan as yet, but the prototype plans make provision for critical workers such as Police, and other security forces to remain in the risk area, quartered in the best available shelter, and rotated with other personnel from the host area, possibly on a daily basis. We are not yet convinced this is the best method for security of a large metropolitan city such as the District of Columbia.

16. What nuclear radiation fallout protection is provided in the host area?

Response: Several years ago the counties designated as our host areas were surveyed as part of the National Shelter Survey program. Records indicate there is minimal shelter from fallout in the rural areas, but cities such as Fredericksburg, Culpeper, Staunton, etc. have fairly well developed downtown areas with shelters. New DCPA surveys in the next few years will give us up-to-date information on what fallout protection is available in the host areas.

17. What percent of the population covered in your plan has designated shelter areas?

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Response: In the District of Columbia there is a surplus of shelter space for the resident population. Our Community Shelter Plan lists the shelters by election wards and indicates that each ward has ample space for its citizens. No specific shelter assignments are made under the current plan because we feel this is unrealistic from a planning standpoint for a city such as the District of Columbia.

18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Response: Any relocation plan we would develop would be based primarily on a nuclear emergency. The climatological history of this area shows there has never been a natural disaster in which evacuation would have been necessary, or could have been accomplished in time to substantially reduce loss of life. However, once such a plan is produced, the relocation maneuver and logistics would apply whether the people were evacuating because of a nuclear threat or some other non-war caused calamity.

19. As Mayor of one of the larger cities having to deal with transportation related problems—

(a) Do you think population relocation is feasible in a crisis situation?

(b) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

(c) Do you think the problems suggested by the previous questions have a practical solution?

Response: (a) We believe it is possible to relocate, but the planners must assume almost ideal conditions in order to write a plan that has a semblance of feasibility. Time, weather conditions, and an excellent information system must all be ideal in order to execute the maneuver.

(b) We view it as a factor that would increase survival for those who were able to relocate, but we are not yet sure it is the most "practical" solution. Small metropolitan areas are able to write crisis relocation plans with few logistical stumbling blocks, but the large cities have a real problem in executing such a maneuver.

(c) Some of the solutions seem practical but are always negated by a second or third factor that seems impractical. For instance, a blast shelter construction program for the cities identified as risk areas would make relocation unnecessary, but the cost of such a program is so high that many deems this solution "impractical".

20. The Committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

Response: Nothing further at this time.

OFFICE OF THE MAYOR,
Miami, Fla., January 12, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs,
U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: Enclosed is the completed questionnaire concerning Crisis Relocation Planning (CRP) which you requested in your letter of December 18, 1978.

Please excuse the delay in replying to your letter. It was received during the Christmas Holiday period when many of our key staff members were on leave and unavailable to discuss the questionnaire. However, Mr. A. C. Fischer, Supervisor of our Civil Defense Division, called Willard Holmes on your committee staff when it was apparent that we could not meet the January 4, 1979 deadline. Mr. Holmes advised that sufficient replies had been received to meet the Committee's requirement but that we should submit our completed questionnaire to become a part of the official record.

I hope that the information provided will be of assistance to the Committee.

Sincerely,

STEPHEN P. CLARK,
Mayor.

Enclosure.

QUESTIONS RELATING TO POPULATION EVACUATION OF METROPOLITAN AREAS

Question 1. Do you now or have you ever had a population evacuation plan for your city? If so for what purpose?

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Answer. Yes, for Hurricanes. Dade County Plan provides for evacuation of flood threatened areas.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. No. County does not have a CRP—has been instructed to await receipt of State CRP. We do have CSP.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. No.

Question 4. What division or office in your city government is responsible for population evacuation?

Answer. Board of County Commissioners.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, State or Federal officials?

Answer. Annually.

Question 6. To what extent are Federal, State and local governments included in your program planning?

Answer. 0 percent Federal, 10 percent State, 90 percent local.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. Dade County General Fund and State administered DCPA matching funds.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. None.

Question 9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Answer. Yes. 85 percent operational (lacks EMP protection and some communications facilities) Yes.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. No. We have no CRP as yet.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Answer. Unknown. If and when a CRP is developed, available govt., commercial and private facilities will be used.

Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. Unknown.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

Answer. None. We have no State CRP on which to base logistics data.

Question 14. What are the plans for reuniting separated family units?

Answer. Not developed. No CRP.

Question 15. What provisions are made for protection of property during and after the evacuation?

Answer. None at this time, except for normal police functions.

Question 16. What nuclear radiation fallout protection is provided in the host area?

Answer. Unknown.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. Unknown, since no plan has been developed.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Answer. Dual purpose.

Question 19. As Mayor of one of the larger cities having to deal with transportation related problems:

(a) Do you think population relocation is feasible in a crisis situation?

Answer. Yes, if properly planned and organized, provided sufficient warning time is given and host area(s) can accommodate.

(b) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

Answer. Yes, based on answer to 19(a).

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(c) Do you think the problems suggested by the previous questions have a practical solution?

Answer. Yes, given enough time, money and public as well as governmental support to develop an adequate CRP.

Question 20. The Committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

Answer. Because of the limited number of evacuation routes available and the amount of time required to move Dade County's population across the Everglades, unless considerable movement time could be guaranteed and proper accommodations were assured in host areas it is our feeling that the option of remaining in place and implementing our Community Shelter Plan would be the most logical solution to the problem.

OFFICE OF THE MAYOR,
Honolulu, Hawaii, December 29, 1978.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs,
U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: Reference is made to your letter of December 18, 1978, requesting answers to questions relating to population evacuation of metropolitan areas.

The answer to the first question is "no". Accordingly, the ensuing questions are not applicable with the exception of numbers 9, 18 and 19.

In response to question 9, we have an Emergency Operating Center (EOC) constructed in fiscal year 75 with matching federal funds and designed in accordance with Defense Civil Preparedness Agency specifications. The facility is incorporated within the offices of the Oahu Civil Defense Agency, City and County of Honolulu which is manned on a work-day basis. During periods of emergency or potential emergency the operating staff is expanded to include a representative of each city and county emergency service. The emergency staff functions 24 hours a day throughout the period of emergency. The EOC has a radiation protection factor (PF) of over 3,000, complete city and county communication nets for all emergency services, public utilities, and volunteer services. It also includes controls for our islandwide siren warning system, an emergency power supply, and a 14-day food stockage for an emergency staff of over 100 persons.

In response to question 18, in the development of population relocation plan the focus would be dual purpose (both natural disaster and nuclear emergency.)

I wish to defer an answer to question 19 pending the completion of an extensive study and plans on crisis relocation currently being conducted by the State of Hawaii Civil Defense Division. That effort is under a 100 percent federally funded contract which commenced in March 1975 and is scheduled for completion March 1981. In this regard the State Civil Defense Division is preparing and will forward separately complete answers to your list of questions as they pertain to this metropolitan area.

Warm personal regards.

Sincerely,

FRANK F. FASI,
Mayor.

CITY OF INDIANAPOLIS RESPONSE TO QUESTIONNAIRE RELATING TO POPULATION EVACUATION OF METROPOLITAN AREAS

Question 1. Do you now or have you ever had a population evacuation plan for your city? If so, for what purpose?

Answer. The city of Indianapolis does not currently have a plan for population evacuation. In the 1950's our city had a very basic plan, known as "Operation Iron Horse". The purpose of that plan was to relocate the population prior to a conventional weapons attack.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. Does not apply.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. Does not apply.

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Question 4. What division or office in your city government is responsible for population evacuation?

Answer. The Division of Emergency Planning and Civil Defense is responsible for all emergency preparedness activities, which would presumably include evacuations. The Division would receive support from public safety agencies, social service agencies, and transportation organizations.

Question 5. How often are your population evacuation plans and operations reviewed by city officials. State or Federal officials?

Answer. The plan mentioned in our response to question 1 has not been reviewed since it was prepared.

Question 6. To what extent are Federal, State and local governments included in your program planning?

Answer. Does not apply. (All levels of government are involved in other aspects of our Emergency Operating Plans.)

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. No funds have been spent specifically on population evacuation planning.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. Does not apply.

Question 9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Answer. The city of Indianapolis Emergency Operating Center was constructed in 1967. The E.O.C. is in a subterranean location with "hardening" per Federal specifications. Auxiliary capabilities are in place for electricity, water, sewage treatment, heating and ventilation. The E.O.C. has sufficient supplies and facilities to permit essential personnel to function with relative comfort for thirty days.

All major police agencies, fire departments, and utilities have communications equipment in the E.O.C. Most of this equipment duplicates equipment located elsewhere in the city. Also, our Radio Amateur Communications Emergency Service and American Red Cross operate from this center. Maps, charts and guides are available in abundance in the center.

The E.O.C. is not in daily use. The preparation and operation of the E.O.C. is the responsibility of the Division of Emergency Planning and Civil Defense.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. No neighboring municipalities have population evacuation plans.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Answer. Does not apply.

Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. Does not apply.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

Answer. Does not apply.

Question 14. What are the plans for reuniting separated family units?

Answer. Does not apply. (Our city does have provisions for this need in other situations.)

Question 15. What provisions are made for protection of property during and after the evacuation?

Answer. Does not apply. (It is presumed that law enforcement agencies and fire departments would remain available for property protection purposes.)

Question 16. What nuclear radiation fall out protection is provided in the host area?

Answer. Does not apply.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. Our city has sufficient public shelter space to accommodate 40% of the population. None of these shelters now have survival supplies stored as the items became inedible and/or dated and removed.

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Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Answer. All Emergency Operating Plans of the city of Indianapolis are intended to serve during all types of catastrophes. A population evacuation plan would certainly be prepared to meet natural disasters and nuclear emergencies.

Question 19. As Mayor of one of the larger cities having to deal with transportation related problems—

(a) Do you think population relocation is feasible in a crisis situation?

(b) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

(c) Do you think the problems suggested by the previous questions have a practical solution?

Answer. The city of Indianapolis must consider the effort required to relocate one million persons when considering the worthiness of population evacuation during crises. Even though our city enjoys a very fine ground transportation system, the prospect of having to relocate the entire population is mind boggling. The organization and effort required to accomplish this task would far exceed anything our city has ever experienced.

Perhaps, though, after all costs and demands have been considered, population evacuation may prove to be the most appropriate alternative. If data supporting the superiority of crisis relocation over other alternatives has been developed, this office has not had an opportunity to review it.

Regardless of the means selected as the best for protecting the population from nuclear assault, our city simply does not have the resources to develop and implement a meaningful plan. Moreover, in the case of population evacuation, numerous governmental entities would be involved—not only in accomplishing evacuation, but in coordinating and preparing "host" areas.

CITY OF NEW ORLEANS—QUESTIONS RELATING TO POPULATION EVACUATION OF CITY OF NEW ORLEANS

Question 1. Do you now or have you ever had a population evacuation plan for your city? If so for what purpose?

Answer. The State of Louisiana has a plan for evacuating the city of New Orleans in case of disasters other than nuclear attack. This plan is part of the Mass Coastal Evacuation Plan of the Division of State Police, and consists of designated primary and alternate evacuation routes and instructions for their use.

According to New Orleans Civil Defense, mass evacuation of the city of New Orleans is not feasible; however, should mass evacuation be ordered by proper authority, the primary and alternate evacuation routes designated by Louisiana State Civil Defense for New Orleans would be used.

New Orleans Civil Defense has an evacuation plan for moving residents to fallout shelters within the city in case of nuclear attack, and the City Administration is now developing a separate evacuation plan for moving residents to shelters within the city in case of natural disasters.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. The city of New Orleans has two separate plans for evacuation to shelters within the city, since different locations and types of shelters are required. Fallout shelters are located throughout the city and meet Civil Defense criteria, whereas natural disaster shelters are located at a safe distance from water bodies and on high ground and are structures with at least two stories. Evacuation routes are therefore different for the two plans, but the evacuation process is the same.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. Never tested.

Question 4. What division or office in your city government is responsible for population evacuation?

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Answer. Natural disaster evacuation—Mayor's Office, Nuclear disaster evacuation—Civil Defense.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, State or Federal officials?

Answer. Annually reviewed by city officials.

Question 6. To what extent are Federal, State and local governments included in your program planning?

Answer. Because evacuation will probably occur only within the city boundaries, primary planning responsibility rests with local government, State officials are consulted to assure coordination and cooperation.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. None so far. Planning is still in process.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. In a natural disaster, the Mayor's Office coordinates and directs all disaster actions. All city departments and agencies will generally perform the same or similar functions that they normally perform but at a more intense level. The Police Department is primarily responsible for emergency medical services. Four emergency operating bases are located throughout the city, staffed respectively by the Mayor's Office, Police Dept., Fire Dept., and Civil Defense Evacuation will be directed by the Police Dept.

Natural disaster shelters are operated by the American Red Cross. The Mayor's Office maintains communication with non-city agencies such as the Governor's Office, American Red Cross, Civil Defense, National Guard, Levee Board, South Central Bell Telephone, New Orleans Public Service (private utility), Corps of Engineers, and the Coast Guard.

The duties and responsibilities of city agencies are similar during nuclear and natural disasters, except that nuclear disaster actions are directed by the Civil Defense in consultation with the Mayor's Chief Administrative Officer instead of by the Chief Administrative Officer.

Question 9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Answer. For natural disasters, the Mayor's Office has been designated as the City Command Post (i.e., primary emergency operating center) but has not yet been equipped for that purpose.

For nuclear disasters, Civil Defense has an underground primary emergency operating center with facilities to house and feed 200 people for two weeks, and communications facilities with links to appropriate Federal, State, local and private agencies. It has a permanent staff which is funded through the Police Dept. City Hall functions as a secondary emergency operating center during a nuclear disaster.

The Civil Defense emergency operating center is inappropriate for natural disasters because it is near the lake and thus subject to flooding and is too far from City Hall for efficient coordination among City departments.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. Not at this time. The Federal Disaster Assistance Administration has agreed to provide the city of New Orleans with a disaster planner (full-time for one year) to coordinate disaster preparedness planning on a regional scale encompassing several parishes.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Answer. Not applicable regarding evacuation of New Orleans because such mass evacuation is impractical. Plans for transportation of evacuees to shelters inside the city boundaries are currently being worked out.

Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. Not applicable.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

Answer. The city government is responsible only for evacuation of residents to shelters. The American Red Cross is responsible for managing and supplying the natural disaster shelters.

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Question 14. What are the plans for reuniting separated family units?

Answer. No such plans.

Question 15. What provisions are made for protection of property during and after the evacuation?

Answer. The Police Dept. will intensify its patrol activities during and after a disaster to protect property.

Question 16. What nuclear radiation fall out protection is provided in the host area?

Answer. Not applicable.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. Under the Civil Defense plan for nuclear disaster preparedness, 100 percent of the city's population can be accommodated in designated fallout shelters, with excess spaces remaining.

Under the city's natural disaster plan, about 10 percent of the population could be accommodated, but the Mayor has the authority to commandeer more shelters as needed. It is not likely that the entire population would need to evacuate to public shelters during a natural disaster.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: Natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Answer. Dual purpose.

Question 19. As Mayor of one of the larger cities having to deal with transportation related problems—

(a) Do you think population relocation is feasible in a crisis situation?

Answer. Mass population over long distances, especially to areas outside the city, would not be feasible.

(b) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war.

Answer. No.

(c) Do you think the problems suggested by the previous questions have a practical solution?

Answer. Don't know.

Question 20. The Committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

OFFICE OF DISASTER CONTROL AND CIVIL DEFENSE,
Baltimore, Maryland, January 3, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs.
Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: This is in reply to your letter of December 18, 1978, to the Honorable William Donald Schaefer, Mayor of Baltimore on the subject of Civil Defense.

Mayor Schaefer has asked me to reply to you and I do so herewith. The numbered paragraphs below are in categorical reference to your list of questions.

1. The city of Baltimore had an evacuation plan in the 1950's to save the population from nuclear attack. The policy of evacuation was displaced by the National Fallout Shelter Program which continues today in this city.

2. The plan was equally applicable to both natural disasters and nuclear alert situations.

3. The only testing that occurred was in the form of map exercises.

4. The Office of Disaster Control and Civil Defense is responsible to the Mayor for population evacuation.

5. The operations of this office are reviewed regularly by Federal, State and local authorities; a new evacuation plan for Crisis Relocation is now being written.

6. Program planning in this office is closely monitored by Federal and State agencies.

7. The population evacuation plan of the 1950's was written "in house"; current planning for Crisis Relocation is also "in house" with advice and guidance from Federal and State officials. There are no financial resources allotted to this office for the planning.

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8. Duties and responsibilities to be assigned to various city agencies and public utilities are as nearly as possible commensurate with their normal functions. The important things are to move the population, maintain continuity of government, and provide the essential services necessary for the well being of the city and its people.

9. Baltimore City has an emergency operating center. It has every capability necessary to communicate and coordinate disaster and recovery operations and can function for extended periods. It is in daily use.

10. Yes, through the State Plan.

11. Up to 200 miles using private and public transportation such as buses, trucks, trains and boats.

12. It is considered that three days would be necessary for evacuation; evacuees could expect to remain in host areas for up to two weeks.

13. The support annex has not yet been written but people will be encouraged to take supplies with them. Host areas have yet to say what support from the city will be required.

14. Social Services and volunteer agencies will cope with this problem as best they can.

15. Security of the city is the responsibility of the Police during and after evacuation.

16. Nothing is known here at this time concerning nuclear radiation fallout protection in the Host areas. Plans will include the augmentation of such protection by specific agencies.

17. In Baltimore City 100 percent; in the Host areas this information has not yet been made available to us.

18. The city has a natural disaster evacuation plan. The Crisis Relocation Plan in the making will primarily serve for a nuclear emergency but could also be used otherwise.

19. Mayor Schaefer does think that population relocation is feasible. He supports fully the planning for Crisis Relocation and sees it as a way to increase population survivability in the event of a nuclear war.

20. I think the problems surrounding Crisis Relocation can and will be solved because the alternative to population survival is unacceptable.

Sincerely,

WILLIAM U. OGLETREE,
Director.

DEPARTMENT OF CIVIL DEFENSE,
Boston, Mass., January 2, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs,
U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: In response to your letter of December 18, 1978, the answers to your questions are as follows:

1. An evacuation plan was in existence in the late 1950's. That particular plan has since become absolete.

2. No.

3. It has not been deemed advisable to conduct actual tests of evacuation plans at this time.

4. Local Civil Defense in cooperation with the State and Federal Office of Emergency Preparedness.

5. Not applicable.

6. All Civil Defense activities are conducted on a joint Federal, State, and local basis.

7. Evacuation Plan is essentially in the planning stage at Federal and State Offices of Emergency Preparedness, along with informational seminars occurring at the local levels.

8. Liaison assistance.

9. Yes. Capable of providing direction and control to the various operational departments and outside private agencies capable of providing emergency assistance. Daily use as an administrative facility for the Mayor's Office of Public Services. (Federal funds not utilized in its construction in 1967).

10. Again, this stage of the planning is being conducted at the Federal and State level.

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11. The following is based on preliminary work on evacuation planning by Federal and State Civil Defense:

a. Approximately 150 miles.

b. All available modes, principally auto.

12. Two or three days. Approximately 1 to 3 weeks.

13. In the planning stages.

14. In the planning stages.

15. Key public workers, Fire, Police, Public Works, etc., while daily commuting to nearby host areas.

16. Being planned by host area with Federal and State assistance.

17. Under our current Community Shelter Plan; 100%.

18. Nuclear Emergency.

19. The answer to 19 (a), (b), (c) would be:

Such a plan may be feasible only with the complete approval and support of the Federal Government, and particularly the President of the United States. It is only through this manner of certification at the highest level will there be the degree of support on behalf of the public.

Very truly yours,

WALTER J. CAMEBON,
Director.

CITY OF DETROIT EXECUTIVE OFFICE,
February 6, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs,
U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: I am pleased to transmit our responses to your Committee's questionnaire on our civil defense program.

Please let me know if we can provide further information to the Committee.

Sincerely,

COLEMAN A. YOUNG,
Mayor.

Enclosure.

RESPONSE TO QUESTIONNAIRE RELATING TO POPULATION EVACUATION OF METROPOLITAN AREAS

1. Yes, the City of Detroit has evacuation plans. The plans are known as Crisis Relocation Planning (C.R.P.) and Community Shelter Planning (C.S.P.). These plans are for the purpose of evacuating and/or protecting the citizens in times of natural disaster and nuclear attack.

2. Yes, the plans are equally applicable to both natural disaster and nuclear alert situations.

3. C.R.P. has not been tested. C.S.P. has been tested and executed on a limited basis during flooding and severe snow storm.

4. The Civil Defense Division of the Detroit Fire Department is responsible for the planning of population evacuation.

5. The evacuation plans and operational procedures are updated, reviewed, and approved every two (2) years.

6. Federal, State and local governments determine the criteria for operations, conduct seminars for improvements, render assistance in planning and are available for monitoring operations.

7. The financial resources are allocated through the fiscal management and policies of the city, State and Federal governments.

8. The theory of C.R.P. (Crisis Relocation Planning) calls for a total commitment of government agencies and private industries. The plan requires coordination and cooperation in order to accomplish the task. The fragmentation of responsibilities would result in total chaos.

9. The city of Detroit has an emergency operating center. It has the capability of accommodating the elected and appointed city officials. It is not in daily use.

10. The evacuation plan for the city of Detroit is coordinated with the evacuation plan for Wayne County. Coordination with host areas is in the formalization stage.

11. The evacuees will have to travel approximately 250–260 miles northwest from the city. Transportation includes private automobiles, buses, and aircraft

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12. It is not known how much time is required to evacuate the city of Detroit. The theory is that the evacuees would have at least three days of prior notice of nuclear detonation. The plan estimates that the evacuees would be in the host area for a period of three weeks to an indefinite period.

13. The C.R.P. (Crisis Relocation Planning) mandates that the host area provide the necessary supporting services such as food, shelter, water, medicine and sanitary facilities.

14. The plan calls for essential workers and their families to be housed together in the host areas. Non-essential workers are to be transported and housed together after registration with Social Services and Red Cross.

15. The protection of property during and after the evacuation would be the primary responsibility of the essential workers such as police and fire personnel.

16. The activation of the host areas C.S.P. (Community Shelter Plan) would provide protection from nuclear radiation fallout.

17. The Community Shelter Plan for the city of Detroit has six hundred and five (605) designated shelter areas. This is sufficient to accommodate essential workers and/or persons expressing the option to remain in the city during a nuclear exchange.

18. The city of Detroit has a relocation plan which focuses on natural and nuclear disasters.

19. (a) Yes. Population relocation is demonstrated daily during rush hour (b) Yes. Providing sufficient notice and time is provided prior to the disaster. (c) Yes. Emphasis should be stressed on planning, preparation and testing of the plan.

20. The theory of C.R.P. and C.P.S. calls for a total commitment and full cooperation from Federal, State, local government and private industry. The plans have their limitations but it is the consensus of opinion that they are feasible and can be executed. Any plan of action is superior than no plan at all.

OFFICE OF THE MAYOR,
New York, N.Y., January 2, 1979.

Re Population evacuation of metropolitan areas.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs, U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: In response to your letter of December 18, 1978, the New York State Office of Disaster Preparedness has been conducting a feasibility study of possible evacuation of high risk areas in the event of an imminent nuclear attack. This project is known as Crisis Relocation Planning (CRP) and is wholly funded by the Defense Civil Preparedness Agency (DCPA), a part of the U.S. Department of Defense. The State plan indicates that a massive relocation effort extending over a period of four to six days would be required to accomplish the successful evacuation of the New York City metropolitan area. It is the opinion of city officials that due to the large number of people living and working in a relatively small geographical area, the successful management of this type of relocation effort is questionable.

Although the city of New York has not been actively involved in the CRP planning effort, it has developed its own contingency plans for city wide emergencies. These city wide plans provide procedures for the systematic management of natural and man-made disasters, including modest evacuation and relocation contingencies. It should be noted however that the evacuation and relocation efforts are limited to a relatively small population over short distances for periods generally not exceeding twenty-four hours.

As I indicated above, the State and Federal government are wholly responsible for examining all the issues that will surface as a result of attempting to evacuate a densely populated metropolitan complex. It is my understanding that they have not yet finalized their plans. May I suggest that your staff contact the relevant state agency for a detailed briefing of the planning efforts to date. Since the State planners possess the most up to date information I think it is appropriate that they respond to your committee's questionnaire.

Police Commissioner Robert J. McGuire is in charge of civil preparedness matters in this city and is anxious to be helpful to your committee. I would urge your staff to contact Commissioner McGuire if he can be of further assistance.

Sincerely,

EDWARD I. KOCH,
Mayor.

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CITY OF PHILADELPHIA,
Philadelphia, Pa., January 3, 1979.

HON. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing and Urban Affairs,
Senate Office Building, Washington, D.C.

Dear Senator PROXMIRE: Your letter with the enclosed Questions Relating to Population Relocation of Metropolitan Areas addressed to Mayor Rizzo has been referred to this Department for reply. A detailed response follows.

Crisis relocation planning in Pennsylvania is in a relatively early stage of development. It will be a year or more before Philadelphia becomes involved in the planning. The emphasis so far has been to concentrate on determining host areas, facilities, and resources required to properly shelter the evacuees from the risk areas. When the state informs the city as to the locations of host areas for the city's population evacuation planning will begin.

Inasmuch as there is no current evacuation plan for the city the answers to items 2 through 8 and 10 through 17 of the Questions Relating to Population Evacuation of Metropolitan Areas are not applicable.

The answers to questions 1, 9, 18, 19 and 20 are listed below:

1. On June 30, 1959 the Philadelphia Operational Plan for the Philadelphia Target Complex was published. Part of this plan was devoted to evacuation in the event of enemy attack utilizing nuclear weapons. A copy of a public information folder relative to the plan is enclosed. The Plan was coordinated with the surrounding counties. Evacuation plans were superseded by Community Shelter Plans in the 1960's.

9. Philadelphia currently has an Emergency Operating Center (EOC) which is located in the basement of the Fire Administration Building. In a full activation it can accommodate 300 staff members (two 12-hour shifts of 150 each).

Communications capability includes:

(a) Access to the radio nets of all city departments.

(b) Radio and teletype communications with the State EOC.

(c) Radio communications with surrounding counties, the Red Cross, Civil Air Patrol, etc.

(d) Access to the Emergency Broadcast System.

The EOC area is used on a day to day basis by the Office of Emergency Preparedness, the Fire Communications Center, the Research and Planning Section of the Fire Department, as well as Staff Services and Command Inspections of the Department. Since its construction in 1976, the EOC has experienced limited activation on several occasions due to severe winter weather conditions and the conduct of exercises.

18. A Crisis Relocation Plan when, as and if developed, would focus primarily on a nuclear emergency, but with modification, could be adapted to peacetime disaster whether of the natural or man made variety. It is difficult to visualize a disaster other than general nuclear war which would lead to the evacuation of the entire city.

19(a). Population relocation while presenting many difficult problems is feasible, providing, adequate plans for shelter, feeding and related matters have been made in advance by the host areas. In addition at least three days would be required to evacuate the city.

(b). Relocation is one possible solution which would contribute to increasing the number of survivors should a nuclear war occur. How effective and how practical it would prove to be would depend upon the prior planning and the time available for implementation when the relocation becomes necessary.

(c). As it stands now our cities are in the position of becoming hostage to the Russians. As long as the Federal government embraces the doctrine of Mutually Assured Destruction, the so called MAD theory, and does little or nothing to protect our urban population, the lives of millions of citizens are being unnecessarily risked. There is probably no perfect plan or combination of plans to protect the population 100 percent in the event of nuclear war. However, it is believed that a combination of providing shelter against all effects of nuclear weapons for the twenty-seven largest cities plus relocation from some areas, would immeasurably increase the survival rate. This would be a very costly program but if the dual use concept were employed it could be feasible. Over the years Sweden and Switzerland have done much to develop all risk shelters of which many have day to day use. It is reported that Switzerland by 1980 will be able to protect its entire population.

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20. The matter of population evacuation plans is not the primary matter to be addressed. Actually, the primary consideration should be given to whether or not Civil Defense is pertinent to the nation's strategic plans. Does it enhance the country's capability to survive a nuclear war? Russia, apparently, has answered this question affirmatively as have other countries. While there seem to be dissenting opinions as to Russian capabilities most observers agree that given the opportunity to implement its Civil Defense plans, Russia would suffer fewer casualties in a nuclear exchange than it suffered during World War II. The Federal government must decide whether or not it wants to have a Civil Defense program. It cannot continue its present policy (or lack thereof), of providing minimal support and requiring local government to assume the responsibility for developing survival programs.

Sincerely,

JOSEPH R. RIZZO, *Commissioner.*

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REN WARNING SIGNALS



EVACUATION ROUTE SIGNS





If evacuation is ordered, follow these signs to survival.

The Food Industry of this area is fully aware of its tremendous Civil Defense responsibilities and is constantly developing its plans to distribute food to the populace in case an evacuation is ordered.

Your family's food requirements will be provided if you always follow faithfully the instructions issued by your Civil Defense officials whenever an emergency arises.

CARRY THIS POCKET FOLDER AT ALL TIMES

SUPPLEMENTARY INFORMATION ON EVACUATION INSTRUCTIONS

1. It is important that all persons leave the city by the nearest evacuation route. Therefore, develop a family plan NOW, so that your family may reassemble at a pre-arranged point as soon as authorized after the evacuation. This may be three or four days. The assembly point you select should be at least 25 miles from central Philadelphia.

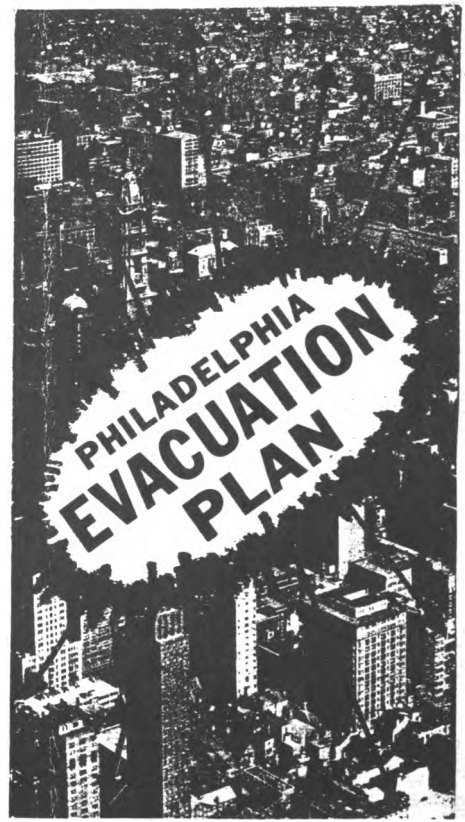


2. Keep the gasoline tank of your motor vehicle at least half-full at all times, so as to reduce the danger of your car running out of fuel.



3. Take your Survival Kit with you, if it is readily at hand, so that you will be sure of food and water for at least three days.





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EVACUATION INSTRUCTIONS

If you are within 12 miles of City Hall when you are instructed to evacuate the city—Follow these basic rules:

1. Move away from center city in all directions immediately on the nearest designated EVACUATION ROUTE.

2. ALL EVACUATION ROUTES WILL BE ONE WAY TRAFFIC OUTBOUND.

3. Join the traffic flow on the nearest EVACUATION ROUTE and continue to follow that route. DON'T CROSS ANY EVACUATION ROUTE.

4. If you are DRIVING a motor vehicle, load it to capacity with passengers and drive out on the nearest EVACUATION ROUTE.

5. If you have a PARKED motor vehicle and can reach it without crossing an EVACUATION ROUTE, get it—load it to capacity with passengers—and drive out on the nearest EVACUATION ROUTE.

6. If there is no motor vehicle which you can use, take any available public transportation (including railroad trains) or walk away from center city.

7. Keep moving away from center city until you are at least 16 miles from City Hall. Go farther if you can.

8. If a vehicle breaks down, push it off the roadway onto the sidewalk, lawn or side road. At all costs. GET IT OUT OF THE WAY.

9. Board subway trains only at 13th and Market Streets or Walnut-Locust Station.

10. Board railroad trains only at the following stations:

a) PENNSYLVANIA RAILROAD—
Suburban Station (16th and Pennsylvania Blvd.)
30th Street Station (lower level only)

b) READING RAILROAD—
12th and Market Street Station
North Broad Street Station

YOUR SURVIVAL DEPENDS ON THE SUCCESS OF THESE EVACUATION PLANS!

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CITY OF MEMPHIS, TENN.
December 27, 1978.

HON. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing and Urban Affairs,
U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: It is a pleasure to respond to your recent letter requesting information concerning the evacuation planning for our area being conducted by Civil Defense.

The evacuation plan for Memphis has been partially completed. According to the schedule provided by Civil Defense planners visiting our city our local evacuation plan should be completed in the near future. We do have enough background information presently developed to supply answers to most of your questions.

Sincerely,

WYETH CHANDLER.

ANSWERS RELATING TO POPULATION EVACUATION OF METROPOLITAN AREAS

1. Memphis has an Emergency Operations Plan which was developed by the Memphis-Shelby County Civil Defense agency. During the past year studies have been conducted in Memphis by the State Office of Civil Defense as the first phase of Nuclear Civil Protection Planing. These studies considered such aspects of Crisis Relocation Planning as essential facilities, population make-up, and evacuation routes. We expect further direction and planning in the coming year from Federal and State Civil Defense. Therefore, we expect to have a completed evauation plan in the near future.

2. While the studies for evacuation have been concerned with Nuclear Attack, it is obvious that portions of the final plan would be applicable to natural disasters.

3. N/A. Our local Emergency Operating Plan has been used in tests and actual emergencies.

4. Civil Defense in coordination with all other agencies of city and county government is responsible for population evacuation.

5. Explained in No. 1.

6. Explained in No. 1.

7. Other than time spent by our local Civil Defense personnel, all expenditures for evacuation planning in the Memphis area have come from federally funded personnel.

8. All duties and responsibilities of local government agencies which are now covered in our local Emergency Operations Plans would naturally be extended to become a part of an evacuation plan.

9. We have an emergency operations center including a 24-hour Communications Center (also having Emergency Medical Services Frequencies). During a recent survey by the U.S. Corps of Engineers the Corps representative stated that our facility was one of the finest local EOC's he had seen.

10. A Conglomerate Briefing conducted for all counties involved in a Memphis evaculation plan took place in Jackson, Tennessee in December 1976. There have been survey studies by the U.S. Corps of Engineers in all potential host counties surrounding Memphis. Thus the evacuation plan will require coordinated planning between Memphis and its host area.

11. Travel distances for evacuees will vary from a few miles to locations within our home county of Shelby to approximately 150 miles to outlying host counties such as Weakley. Transportation provided primarily by evacuees would be supplemented by that of the bus authority school system, etc.

12. The one week minimum evacuation time forecast by federal evacuation planners would be the least time we could hope for in our area. This expectation is based upon our ability to house forty to fifty percent of our population in local shelters. Two weeks would be the estimated time for relocatees to remain out of the city after an attack. This would be affected by the intensity of an attack.

13. Plans for supporting the evacuees in host counties will be developed in the final phases of our local relocation plans.

14. Same as in 13. These plans would, of course, involve the human services agencies as an extension of our local emergency operating plans.

15. Protection of property will be the responsibility of law enforcement agencies and activated military as it is in local emergency operating plans.

16. The local areas could provide shelter for 40 percent to 50 percent of the population in case of a Nuclear Attack.

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17. 40 percent to 50 percent. The variance is due to the question of activating shelters but not stocked.

18. The focus of the population relocation plan will be Nuclear Attack with the knowledge that portions of this plan would be useful in natural disasters.

19. With the perspective of the relocations that took place in England, the U.S.S.R., and other nations in the Second World War we see relocation as a possible, yet difficult, solution to population survival in the event of a nuclear war.

20. We feel that relocation planning is a comparatively economical support to our national defense posture as a deterrent to aggression.

CITY OF DALLAS, ANSWERS RELATING TO POPULATION EVACUATION

The City of Dallas does not have a population evacuation plan. However, it is anticipated that a population evacuation plan similar to the Fort Worth model will be developed in Dallas starting in 1979.

The answers to your questionnaire are in the same sequence as the questionnaire.

1. No.

2. Not applicable at this time. However, when our plan is developed, it will be for nuclear alert situations.

3. Not applicable.

4. Office of Emergency Preparedness for planning; Police, Street and Sanitation (Traffic Engineering), and Texas Department of Public Safety for execution.

5. Not applicable.

6. Not applicable at this time. When initiated, federal, state and local governments will be included.

7. Not applicable.

8. Not applicable.

9. (*a*) 24 hour operations for two weeks in a power off situation.

(*b*) Accommodations, food, and water for approximately 200 people for two weeks.

(*c*) Generators and fuel to provide emergency power for two weeks.

(*d*) Communications:

(1) Police and Fire dispatch.

(2) Ability to transmit and receive in all other radio nets operated by City departments.

(3) Radio contact with the Texas Department of Public Safety.

(4) Radio contact with state EOC in Austin.

(5) Radio contact with the local Red Cross Chapter.

(6) R.A.C.E.S. and Dallas Hospital Council.

(*e*) In the operations room of the EOC, there are maps and displays. Street and Sanitation Department maps show dangerous and blockaded areas throughout the city due to fires, high water, etc. There are hot lines to the police and fire dispatch. There is a radar facsimile machine for watching severe weather. There are maps for posting fallout radiation over a five state area and for Dallas using reporting stations throughout the city. There is a sensor on the roof of city hall remoted into the operations room which would give actual outside readings in the event of a fallout condition.

The EOC is in daily use and portions are operated 24 hours a day.

10. Not applicable.

11. When implemented, furthest distance evacuees will have to travel will be approximately 150 miles.

12. Unknown at this time.

13. Unknown at this time.

14. Unknown at this time.

15. Unknown at this time.

16. Unknown at this time.

17. Unknown at this time.

18. Our proposed population evacuation plan will be focused on nuclear emergency situations.

19. (*a*) Although there are a number of problems anticipated, it is considered feasible to evacuate the population of Dallas and surrounding communties using available transportation means providing at least a 48- hour notification is given.

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(*b*) Relocation is practical only if the host areas can provide adequate fallout protection and life-sustaining support.

(*c*) A response to this question cannot be made in that we have not yet been thoroughly briefed on the philosophy and the details of the proposed solutions for host responsibilities and how they will be able to fulfill them.

20. (*a*) Excluding a direct hit on Dallas and given the same 48 hour advanced warning, better protection can be given the citizens of Dallas using existing fallout shelters. Time would permit minimum stocking of life-sustaining support items in the shelters. However, the possibility of a direct hit cannot be precluded and consequently, population evacuation planning is an alternative that should be pursued.

(*b*) This sort of planning is unique in that it cannot adequately be tested.

Houston, Tex., Questions Relating to Population Evacuation of Metropolitan Areas

1. Do you now or have you ever had a population evacuation plan for your city? If so for what purpose? No.

2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences. NA.

3. If you have a population evacuation plan, has it ever been tested? What were the results of the test? NA.

4. What division or office in your city government is responsible for population evacuation? Civil Defense.

5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials? NA.

6. To what extent are federal, state and local governments included in your program planning? Planning is reviewed by State and Federal Civil Defense.

7. What financial resources were used to develop your population evacuation plan? NA.

8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities? NA.

9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use? Yes. It has the capability to house City and County officials for continuity of government during and following any disaster. Yes.

10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas? NA.

11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees? NA.

12. How much time is required to evacuate your city to the host area? NA. For what period of time do you expect the evacuees to remain in the host area? We do not plan to evacuate to the host area.

13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies). None.

14. What are the plans for reuniting separated family units? None.

15. What provisions are made for protection of property during and after the evacuation? NA

16. What nuclear radiation fall out protection is provided in the host area? NA

17. What percent of the population covered in your plan has designated shelter areas? NA

18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)? Dual purpose.

19. As Mayor of one of the larger cities having to deal with transportation related problems:

(*a*) Do you think population relocation is feasible in a crisis situation? No

(*b*) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war? No

(*c*) Do you think the problems suggested by the previous questions have a practical solution? No

20. The Committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

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We strongly oppose evacuation of our city of 2½ million. We really do not feel there would be enough time after the warning. In June, 1975, we tried to evacuate the downtown area, 5 percent of the populace, at 3:00 pm and there was a traffic jam that took 3 hours to unsnarl. Also, DCPA plans no provisions to care for the people after being relocated. We are of the opinion the only way to deter a nuclear attack is to have a strong capability to retaliate.

JOHN CASWELL,
Assistant Director,
Houston Civil Defense.

CITY OF SAN ANTONIO,
San Antonio, Tex., January 4, 1979.

Hon. WILLIAM PROXMIRE,
U.S. Senate, Committee on Banking and Urban Affairs,
Washington, D.C. 20510

DEAR SENATOR PROXMIRE: Enclosed are responses to questions conveyed by your letter dated December 18, 1978.

We trust that the information provided will be of assistance to the Committee in preparation for hearings on Civil Defense issues on January 8, 1979.

If these are further questions, or more detailed information is required, please contact William T. Stallings, Jr., Coordinator City of San Antonio Office of Civil Defense (512) 225-1567 or (512) 222-8822.

Sincerely,

LILA COCKRELL,
Mayor.

Enclosure.

RESPONSE TO QUESTIONS RELATING TO POPULATION EVACUATION OF METROPOLITAN AREAS

1. The City of San Antonio does have a population evacuation plan (Crisis Relocation Plan) for the purpose of relocating a major portion of the population into 30 counties during a national emergency.

2. The Emergency Operation Plan of the City of San Antonio provides for all contingencies, to include evacuations under nuclear emergencies, natural disasters and local emergencies.

3. The Crisis Relocation Plan has not been tested. Local area evacuations under natural disasters have been successfully implemented.

4. The Office of Civil Defense, a division of the San Antonio Fire Department, is responsible for evacuation planning and coordination.

5. The plans are continuously reviewed, and updated annually.

6. Federal, state and local governments are closely and continually involved in coordinated planning. Coordination at all levels must be on a continuing basis.

7. Financing is by City Approved Budget. However, support by the federal and state governments is through the Personnel and Administrative Program (CPG 1-3), as administered by the Department of Defense.

8. Duties and responsibilities assigned to city government agencies, private industries and public utilities are within the normal function of those agencies. All are charged with developing plans to support the Basic Plan within their capabilities.

9. The City of San Antonio has an Emergency Operations Center that is capable of functioning under disaster conditions. The Center is manned 24 hours per day.

10. The Crisis Relocation Plan has been coordinated with neighboring metropolitan areas, host areas, state and federal agencies.

11. The maximum distance to be traveled by any evacuees is approximately 160 miles. The majority is less than 100 miles. Private and public transportation will be used.

12. The City of San Antonio's Plan is based on the assumption that an absolute minimum of 72 hours (3 days) will be available for movement. The evacuees will remain in the host areas at least two weeks.

13. Plans for relocation of life support, food, medicine, clothing, sanitary supplies, etc., are being coordinated with the Federal and State Departments of Agriculture, the National Defense Transportation Association (NDTA), Bexar County Medical Society, pharmaceutical companies and local wholesale and

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retail grocery companies. Each will plan distribution according to population location in the host areas.

14. Evacuees will move in family groups and will be registered as a family in the host area. Records of family locations will be accomplished through the U.S. Postal Department. If lateral movement for individuals in the host areas is required, it will be coordinated by host area authorities through state agencies.

15. The San Antonio Police and Fire Departments are charged with the protection of the city and approximately 200,000 of its "stay behind" population, including essential workers who will not or cannot be evacuated. Adequate shelter within the city is provided.

16. A survey has been conducted by the Texas Department of Public Safety, Division of Disaster Services, of the host counties assigned to the City of San Antonio. Shelter spaces have been located and provisions made for the construction of expedient shelter in areas where adequate shelters are not available.

17. The City of San Antonio's Plan provides for the Crisis Relocation of 80 percent of the population of 1,000,000. Spaces located in the host areas number approximately 900,000.

18. The City of San Antonio has a single plan which addresses national emergencies, natural disasters, accidental disasters and civil emergencies. "It is a unique plan for a unique city."

19 (*a*) Population relocation is feasible in a crisis. situation.

(*b*) Population relocation is a practical solution to increase the possibility of survival for a large portion of the population who would not otherwise survive.

(*c*) The problems suggested by the question do have a practical solution.

20. The preceding 19 questions have been answered as concisely as possible to reflect emergency planning in the City of San Antonio, Texas.

The following comments are submitted for consideration:

Crisis Relocation Plans must have full support and coordination from the highest levels of government and support and confidence of the populations affected. The most perfect of plans are useless unless the leaders who implement the plan and those who must carry it out are of one mind and one purpose. Therefore a major part of the program should be public information and public guidance from the top levels of government and coordinated effort at all levels of government.

CITY OF MILWAUKEE,
EMERGENCY GOVERNMENT ADMINISTRATION,
Milwaukee, Wis., January 3, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing, and Urban Affairs, U.S. Senate, Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR: On behalf of the Mayor of the City of Milwaukee the following responses to your questions relating to population evacuation of our metropolitan area are tendered.

1. Milwaukee had developed a population evacuation plan in the middle 50's for evacuation of the city in case of atomic attack. Preliminary planning is now in progress to develop a new evacuation plan under current guidance called Crisis Relocation Planning. This new plan will incorporate evacuation procedures for both nuclear attack and natural disaster.

2. Yes. After final planning is completed, specific annexes and Standing Operating Procedures (SOP's) will have to be developed for differing situations of nuclear attack and natural disasters.

3. Plan not that far completed. Has not been tested.

4. Emergency Government Administration.

5. Review by city officials would be as often as necessary to keep plans, annexes, and SOP's updated with changing personnel, differed services, etc. State and local governments, because they have defined divisions of regions of emergency governments constantly update, revise and review these plans.

6. The State Division of Emergency Government has federally funded contract employees on state staff whose purpose is to provide guidance, technical procedures and assistance to local units of government to develop evacuation plans.

7. No dollar input aside from municipal man hours necessary to preliminary planning. Seminars and training sessions to Milwaukee area officials have been funded by the federal government.

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8. At this stage of preliminary planning no duties have been assigned to city government agencies or to private or public resources. As the plan is completed these duties and responsibilities will be clearly assigned to all of these agencies.

9. The City of Milwaukee has an emergency operating center (EOC) which is used as the office for the Emergency Government Administration on a daily basis. As an EOC its capabilities are somewhat limited. It was designed and built in 1952 at a time when CD concepts and potential enemy weapons capabilities and delivery systems differed from those of today.

10. Yes, Milwaukee, Part of Waukesha, and Ozaukee counties are included in the risk areas. Washington, Part of Waukesha, Jefferson, Dodge, Columbia, Sheboygan, Fond du Lac, Green Lake, Marquette, Waushara. Adams, Juneau, Wood, Portage and Marathon counties are host counties for Milwaukee Metropolitan area.

11. Travel distances from close in to farthest out range from 50-180 miles, easily "one tank of gas" and a maximum of four hours travel time. Preliminary planning indicates a large percentage would be private automobiles. Public mass transit may be utilized in final planning.

12. Federal and state guidelines indicate that the public would be programmed to evacuate within 72 hours. They would be expected to stay one week or more.

13. Unable to answer until federal and state agencies develop a plan for food. medicine, etc. Then it will be the responsibility of the host county to implement these plans.

14. Admittedly this poses a problem. Just as within the city's shelter system, however, shelter managers will submit names of shelterees to the EOC, so too could shelter managers throughout the host areas submit the names and allocation areas of the shelter occupants to a county EOC and from there to an area EOC Answering queries and reuniting of family members could place at each level of reporting. This is but one possible solution. The Post Office has forms for the location of addressees. Final solutions would be incorporated into CRP when completed.

15. The aforementioned SOP's would have to be developed by city services, police, fire, health, etc., as to the overall risk area plan. This has not yet been completed. Some police and fire would remain in the risk area.

16. While most host counties have almost enough fallout shelters for their own population, a resurvey of all of the host counties will have to be completed prior to further planning development. Where a deficit exists, expedient shelter would have to be constructed.

17. Reference is made to the answer to question No. 16 above. No percentage has been identified at this time. Planning development would be for 100 percent.

18. Dual purpose.

19. My answers to parts a) and b) of question No. 19 are in the affirmative. As to part c), the answer could be yes if federal funds and guidance were provided, and planning thorough and adequate, and public information intense and complete.

20. A community shelter plan is not sufficient since people, faced with an impending disaster, will either go or stay. Those who go will need a place to go to where they will find food, shelter, and clothing. Crisis relocation planning would accomplish this. It therefore becomes a fitting complement to a community shelter plan for providing protection for all.

The problems involved in CRP are many and the ultimate cost not insignificant; nevertheless, we feel Americans are precious and worth the cost.

Very truly yours,

DANIEL J. GRACZ, *Coordinator.*

APPENDIX 2C

STATE OF ARIZONA,
DIVISION OF EMERGENCY SERVICES,
Phoenix, Ariz., January 3, 1979.

Hon. WILLIAM PROXMIRE,
U.S. Senate Office Building, Room 5241, Washington, D.C.
Washington, D.C.

DEAR SENATOR PROXMIRE: The State of Arizona and selected political subdivisions have been involved in population evacuation planning since 1974. A

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feasibility study was done for crisis relocation that centered upon Tucson and environs. The feasibility study identified no insuperable obstacles to the concept of relocating and supporting approximately one half million people in five predominately rural host counties.

On the basis of the feasibility study, a Federal, State and local planning team began work on detailed risk area and host area operations plans and the State plan for supporting relocated population. This planning effort was one of several such prototypes initiated under sponsorship of the Defense Civil Preparedness Agency in selected areas of the United States.

The success of the prototype effort has resulted in the following major accomplishments:

Host area government approval of their crisis relocation plans.

Completion of a draft evacuation plan for the Yuma Risk Area.

Completion of a feasibility study of the Phoenix/Maricopa Risk Area which identifies no insuperable obstacles to the evacuation of one and one third million residents to parts of the eight remaining political subdivisions of the State.

Initiation of host area planning for the accommodation of the evacuees from Yuma.

Exercising of some host jurisdictional plans to test plan viability and to identify areas of planning needing improvement. A risk jurisdictional exercise is scheduled.

While I cannot answer all of the questions that have arisen concerning crisis relocation on the basis of the Arizona experience, I am pleased to report that we are developing credible, workable plans on a coordinated basis. However, it is only fair to indicate that Arizona initially was not favorably disposed to adopt a protective option encompassing the relocation of over one and three quarter million people from the three most heavily populated areas of the state to satellite upon the remaining twenty two percent of the state's population. Our participation in the feasibility study and in prototype planning has totally reversed Arizona's original position even though we played "devil's advocate" throughout much of that period. Granted, the task of planning for such a contingency is a monumental one and requires the devoted efforts of energetic and innovative planners, but it has been and can be done at a fraction of the staggering costs of other forms of protection for the American people.

I have taken the liberty of providing an overview of Arizona's concept of crisis relocation as it evolved during the planning effort. Be assured that the concept is supported by coordinated, detailed State, host and risk operations plans.

Sincerely,

CHARLES A. OTT, Jr., *Director.*

Attachment.

ARIZONA CONCEPT FOR CRISIS RELOCATION

Crisis Relocation is the orderly evacuation of population at risk of injury or death from the primary effects of nuclear weapons and their reception and care in less vulnerable areas of the State called host areas. Care include the provision of fallout protection in the host areas for relocated and resident population as well as the essentials of survival.

The maneuver is a coordinated emergency operation of immense proportions and is to be carried out in four phases under the direction and control of State, county and local government. Phasing includes an alert during which governments undertake planned actions preparatory to initiating movement and reception and care operational phases. Plans also provide for transition to nuclear attack operations or a return to evacuated areas and the restoration of normalcy.

The term crisis relocation suggests that a deterioration in our relations with other nations has placed the people of the United States at risk of attack. The international problem may have had its origins in peripheral conflicts of interest from which big power confrontation derived. Arizonans would be made aware of the deepening crisis via normal means. Radio, television and the newspapers would keep the public informed concerning the international situation. As part of increased readiness, government and particularly local government, has an obligation to promote civil defense awareness in the public sector. The public will be reminded that the community, the state and the national government have planned for such a contingency and are making preparations consistent with the established condition of readiness. General family survival information would flow from government to the public via the media.

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Based upon information received from the national level the Governor of Arizona will alert appropriate officials in the political subdivisions of an intent to issue an order to evacuate Arizona's risk areas and to relocate population in accordance with crisis relocation contingency plans. State, county and local community governments then initiate planned alert phase actions. Risk areas prepare to evacuate according to plan. Host areas prepare to receive and accommodate the relocatees allocated in the plans.

State emergency highway traffic regulatory forces will deploy according to plan, preparatory to exercising control of evacuation traffic using the state highway system. Meanwhile, state emergency government, operating from the state emergency operating center under direct control of the Governor, will take planned action preparatory to redirecting the essentials of survival to the host areas in sufficient quantity to meet both relocatee and resident population requirements. Emergency government in this instance includes expertise from the public sector competent to suspend normal deliveries to risk areas and to deliver essential supplies in accordance with needs detailed in the State plan to host areas from in-State wholesale operations.

Risk area government plans provide for the production and distribution of information to residents concerning the evacuation. Host area government plans provide for residents to receive the information they require concerning host area activities. Host area government plans also provide for relocatees to receive at reception the information they require concerning host area activities.

When the governor issues the order to relocate, the planned activities that have been ongoing during the alert phase and the earlier increased readiness actions will facilitate the initiation of the movement phase of operations. Evacuation of people from Arizona's risk areas involves moving as family units by private auto onto the state highway system in a controlled manner and driving to predesignated destinations. Those without private transportation would be provided public transportation. Travel distances do not exceed 200 mi.

The reception and care phase of operations commences with the arrival of relocatees at reception centers in the host areas. As relocatees pass through the reception centers, family groups will be registered and classified as to essential skills represented in each car load. Each relocatee will be assigned a lodging, a place to eat and a fallout shelter. Vehicles will be immobilized in host areas to the maximum extent possible. The reception and care phase and State operations in support of this phase may endure for a period of one to several weeks.

Since we are moving large numbers of people into areas of the state in which fallout shelter is already insufficient to meet the needs of the resident population, many of the non-residential structures in which relocatees are billeted will be upgraded to provide expedient fallout shelter for both host area residents and relocatees. The techniques for upgrading structures were developed by the U.S. Army Corps of Engineers. The specific structures to be upgraded and procedures for doing so are delineated in host plans.

In host areas one of the major logistic problems occasioned by crisis relocation is the reduction in days of supply of essentials resulting from the influx of people. As evacuation traffic decreases near the end of the movement phase, the redirected flow of essentials from wholesale to the host areas must be initiated by the State Resource Control Group. To be certain that there is adequate availability of food, baby needs and other items in host areas during the first critical days, relocatees are instructed as part of their preparations for evacuation to bring certain essentials with them from the risk area.

A second logistic problem is the shortage of earth gathering and earth moving equipment in many host areas. The success of the fallout shelter upgrading effort is dependent upon the timely movement of large quantities of soil. Equipment and operators excess to risk area needs will be moved to host areas and augment host engineering capabilities so that shelter upgrading may be accomplished within 72 hours.

Firefighting resources from the risk communities have been allocated to relocate and support host area fire agencies. Law enforcement resources from the risk areas have been allocated. Medical service capabilities and public health resources from the risk area have been allocated to support host area medical and health services. In general, organizations relocating equipment will evacuate the risk areas in accordance with organizational relocation plans that require them to relocate either before or after the general public.

Key functions must continue in the risk areas. In essence, a risk area is not totally evacuated. A minimum number of people are placed at risk to continue

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the essential functions of government and selected industries. Organizations required to continue risk area operations will relocate personnel during the movement phase to host areas nearest the risk area periphery. The risk area operations work force will commute to the risk areas from nearby host areas on a shift basis. Shelter plans provide for the all weapons effects protection of the risk area operational contingents.

It is possible that the crisis that precipitated relocation would be resolved short of war or, it could culminate in an attack. The Governor will terminate crisis relocation on the basis of information received from the national level. The return to risk areas would be a phased movement utilizing the same evacuation routes used during the relocation.

If an attack should come, relocatees would remain in the host areas after the general release from fallout shelter. The community would resume reception and care phase operations. The Governor would direct the return of risk population based upon damage assessments and the progress of recovery operations.

With minor modifications, a crisis relocation plan may be used to conduct peacetime evacuation of a risk community or any part of a risk community. The methodolgy, population and movement time estimates, routes, control mechanisms and instructions to the public are already planned for. Unfortunately, in this State, and probably many others. evacuation contingency plans for peacetime hazards are applicable to many host communities as well. Crisis relocation host area plans have little utility in such circumstances.

DEPARTMENT OF CIVIL DEFENSE AND EMERGENCY SERVICE,
Maricopa County, Ariz., January 4, 1979.

Hon. WILLIAM PROXMIRE,
U.S. Senate Office Building, Room 5241,
Washington, D.C.

DEAR SENATOR PROXMIRE: As Director of the Maricopa County (Arizona) Department of Civil Defense and Emergency Services I have been deeply involved in Civil Defense matters for nearly twenty years, and during this time I have watched with dismay as our Civil Defense capabilities have steadily eroded in sharp contrast to the Russians who have significantly expanded their Civil Defense efforts.

I feel that we must objectively consider all alternatives which may increase our chances for survival in the event of a nuclear war. In this regard I do not consider that the theory of mutual deterrence remains valid today. This theory is postulated on the premise that there is no effective defense against a nuclear attack and thus Civil Defense programs, ABM's and air defenses have been discounted by many civilian arm-chair strategists. I do not subscribe to this no-win philosophy which assumes a decidedly non-American defeatist attitude and wrongly concludes that Civil Defense program will make no difference in a nuclear war.

In essence there are woefully few options to consider, for the initial SALT negotiations placed extreme restrictions on our offensive capabilities vis-a-vis the Russians and the SALT II talks would appear to be dangerously limiting our capacities to even maintain parity. Thus we must critically examine our Civil Defense options which on an effectiveness basis are limited to: providing for sufficient blast resistant facilities to protect the entire population residing in high-risk areas; relocating those residing in high-risk areas to designated host areas: or a combination of the two. Since the cost of constructing sufficient numbers of blast shelters is prohibitive in terms of today's economy, the thrust must be to the concept of crisis relocation.

I feel that the present concept of crisis relocation is a viable alternative which must be vigorously pursued. I base my conclusions from detailed studies of the program and the benefits which can result if the planning is sound, thorough and coordinated at all levels with appropriate officials. I recognize that there are many inherent problems associated with crisis relocation, and that in certain parts of the country, in particular the megalopolises of New York City and Los Angeles, it may not be possible; however if only partial implementation could be effected, it would still represent a significant savings in lives.

In your questionnaire (questions 10 through 17) you indicated several areas of apparent concern which I should like to address. Although we do not yet have

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an operational crisis relocation plan, our preliminary planning coupled with our feasibility study provides the rationale for our approach to these problems.

10. The Phoenix/Maricopa risk area plan, when completed, together with the Arizona State crisis relocation plan will provide the necessary linkages to ensure a highly coordinated and effective plan.

11. The feasibility study limited evacuee travel distance to a maximum of 200 miles. It is contemplated that families would use privately owned vehicles, supplemented with public transportation for those requiring transportation.

12. Studies show that the population within the Phoenix/Maricopa risk area can be evacuated in less than 72 hours by utilizing the major routes of egress from the metropolitan area to the host area. Host area plans would be flexible and not limit evacuees' stay to any prescribed duration.

13. Logistical plans for supporting evacuees in the host areas were considered in the feasibility study and contemplated the establishment of supply centers in host areas, and a continuation of operations of designated wholesale distribution points in the risk area.

14. This question was not specifically addressed in the feasibility study, although it is considered that provisions would be made to ensure, as far as possible, that families would all be billeted together in the same reception center within the host area.

15. This is a specific problem that would be addressed in the final plan and would include close coordination between all law enforcement agencies.

16. In the host area, if only those shelters with a protection factor of 40+ are considered, a storage of approximately 1,700,000 would exist. Provisions, however, would be made to upgrade spaces in order to provide sufficient fallout shelter spaces for all concerned.

17. There is fallout shelter protection in the greater Phoenix area for approximately 40% of the population. Blast shelter space is practically non-existent.

Another plus factor occurring from developing a solid crisis relocation plan are the benefits derived from the detailed planning that must ensue and the accumulation of data that will directly assist officials at all levels of government, for it will enable them to localize situations and apply procedures learned in the planning process.

I recognize that the City of Phoenix has reservations concerning the concept of crisis relocation particularly in the areas of mass evacuation of the population from the city and the subsequent care of these people in the host area.

These reservations are not uncommon and, are caused in part by an unfortunate comparison of the present concept of relocation with the evacuation plans of the late 1950's. The present concept is much broader in scope, insisting on much more detailed planning in the problems of providing for the needs of the evacuees when they have relocated to the host areas.

I feel that we have the experience, expertise, and the desire to overcome any problem which may arise. I am convinced that our thrust must be directed toward developing and maintaining a Civil Defense posture which will enhance our capability to survive. I feel that crisis relocation offers such a hope, but we do, however, need your support, the vocal and financial assistance from the Federal government, and finally positive direction and strong leadership to achieve this capability. I am sure you will do all in your power to bring this to reality.

Sincerely,

HOWARD G. RYDER, *Director.*

OFFICE OF EMERGENCY SERVICES,
Sacramento, Calif., January 15, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing, and Urban Affairs, Room 5300, Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: This letter is in response to your questionnaire sent to the mayors of San Francisco, Los Angeles, and San Diego regarding relocation/evacuation planning of highly urbanized areas in the State of California. We understand the Committee has already met on this subject; however, because of the importance of this program, I feel compelled to supply the state viewpoint regarding this much needed program and our response is enclosed.

Although crisis relocation has been a part of the national defense program for some time, California has just recently been authorized by the State Legislature

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to participate in the planning effort. The Legislature originally questioned the merits of the program considering California's complex demographic and geographic features. However, based partly on the results of a feasibility study conducted by local consultants, approval was recently granted. The study concluded, among other things:

1. Using DOD unclassified targeting assumptions, four-fifth of California's population resides in potential high-risk areas.

2. The preponderance of structures providing fallout protection are, due to the nature of the construction required, also in the risk areas. Such structures provide only limited protection against the direct effects of nuclear weapons.

3. While relocation of a major portion of California population poses problems of great complexity, the process is feasible.

4. Relocation of the population from the Los Angeles basin would require a minimum of seven days.

5. Relocation planning has the potential for at least doubling the number of lives that could be saved in the event of a nuclear attack.

I recognize there are many and significant problems associated with the development of viable crisis relocation plans. However, in light of the present weakness of the national shelter program, particularly here in California where we have few homes with basements and most of the public shelters are in urbanized/designated risk areas, we must explore crisis relocation as an alternative approach in saving lives in the event of nuclear war.

I appreciate and share your concern regarding appropriate use of public funds; however, in the case of crisis relocation planning I sincerely feel the plans that will be prepared will be useful should they ever be needed. I would much rather have a plan of action developed and hopefully never have to use it, than to need it and not have it.

If I can be of any assistance to your committee regarding evaluation of the crisis relocation effort or other aspects of civil defense, please contact me.

Sincerely,

ALEX R. CUNNINGHAM, *Director.*

Enclosure.

STATE OF CALIFORNIA, OFFICE OF EMERGENCY SERVICES, QUESTIONS RELATING TO POPULATION EVACUATION OF METROPOLITAN AREAS

Question 1. Do you now or have you ever had a population evacuation plan for your city? If so, for what purpose?

Answer. Evacuation planning is not new. California cities have or are developing evacuation plans for various possible situations to include dam failure, flood, nuclear reactor accidents, and crisis relocation.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. Evacuation plans to be useful must be specific to the threat. The area at risk must be identifiable as most those surrounding areas to which people can be moved. Crisis relocation planning is unique primarily due to the large numbers of persons at risk. Eighty-five percent of the citizens of California live in high-risk areas from nuclear attack. Most of the jurisdictions within the State of California have a basic disaster plan which identifies all local hazards including war. Most jurisdictions have a contingency plan directed toward a specific disaster which is most likely to affect their respective communities.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. In the Los Angeles County earthquake of 1971, approximately 80,000 people were successfully evacuated from highly urbanized areas below Van Norman Dam. As a result of that earthquake, all jurisdictions within California which may be subject to flooding from a dam failure are required by law to have a dam evacuation plan and associated emergency public information material. Nine Bay Area counties and Los Angeles and Orange Counties and their jurisdictions have prepared earthquake response/evacuation plans which include the possible evacuation or movement of people. The actual evacuation of people from large urbanized areas is considered too costly as an exercise; however, procedures which would be used by local governments to implement these plans have

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been tested. In addition, all populated areas associated with a nuclear power generating facility have developed and tested evacuation plan procedures.

Question 4. What division or office in your city government is responsible for population evacuation?

Answer. Most jurisdictions in California have an Office of Emergency Services which accomplishes emergency planning in coordination with other local public safety agencies.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials?

Answer. Most of the plans are reviewed annually by those agencies directly concerned with their implementation.

Question 6. To what extent are federal, state and local governments included in your program planning?

Answer. Planning in California is a coordinated effort with all levels of government and the concerned agencies involved.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. Planning is funded primarily with general funds augmented by matching funds provided by federal agencies such as the Defense Civil Preparedness Agency. In the dam evacuation process, private dam owners paid for portions of the planning.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. State and local plans are built on existing agencies and organizations, both public and private. Responsibilities are assigned commensurate with the day-to-day duties and capabilities of the various agencies concerned.

Question 9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Answer. Most large jurisdictions have an emergency operating center (EOC) and emergency communications center (ECC). More often the ECC will be in daily use. Most of these facilities are also protected from the possible effects of nuclear weapons. The State of California has a headquarters EOC at the state capitol and four regional EOCs throughout the state. Not all of these facilities would be suitably protected from nuclear attack.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. California is just beginning the crisis relocation planning process and will address interjurisdictional planning as required. It should be noted that California is divided into 6 mutual aid regions which coordinate resources and operations plans for multi-jurisdictional areas.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Answer. As you know, California has some of the most severe constraints as far as crisis relocation planning is concerned. Therefore, in order to achieve a balanced hosting ratio, people from the major population areas may need to travel up to 200 miles to a host area. California has many transportation resources, therefore we have adequate capability in transporting people.

Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. Most metropolitan areas in California can be evacuated in 72 hours; however, in Los Angeles and the Bay Area, it could take up to seven days. It is the general opinion that people would stay in a relocated mode for a minimum of seven days.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

Answer. For all movements other than for CRP, local resources suitably augmented are sufficient to meet the needs. California is not sufficiently far along with its CRP planning to have developed detailed supporting plans; however, a 1976 study for crisis relocation planning in California and a current study being conducted relating to food distribution systems are expected to provide us with sufficient resources management data.

Question 14. What are the plans for reuniting separated family units?

Answer. This issue is being addressed through the development of emergency public information packets.

Question 15. What provisions are made for protection of property during and after the evacuation?

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Answer. Currently, planning is directed to ensure that sufficient public safety personnel are available for security during a relocation period.

Question 16. What nuclear radiation fallout protection is provided in the host area?

Answer. Over 30 million shelter spaces have been identified in California's 48 counties; however, a majority of these spaces lie in areas which are subject to direct weapons effects. For this reason alone, we feel it is imperative that California move ahead in planning for the crisis relocation option. Currently other structures are being surveyed in potential host areas to determine the ability of these structures to be upgraded to provide protection from radioactive fallout. These surveys have been completed in 12 counties with hosting capabilities.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. Los Angeles, San Diego, and San Francisco would be considered to have an excess of shelter spaces available; the balance of the state is deficient. However, assigning people to shelter in these high-risk areas would be considered ill-advised and inappropriate, defeating the purpose of the relocation option. Therefore, all planning should include the relocation option as an alternative.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Answer. Is it our intent to use the experience gained with the broad aspects of crisis relocation planning to assist us in the further refinement of our natural disaster evacuation planning activities; therefore we consider evacuation/relocation planning to be dual use.

Question 19. As mayor of one of the larger cities having to deal with transportation related problems—

(*a*) Do you think population relocation is feasible in a crisis situation?

(*b*) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

(*c*) Do you think the problems suggested by the previous questions have a practical solution?

Answer. As director of the State of California Office of Emergency Services, I:

(*a*) believe even though California has the most severe planning restraints and possibly the largest population at risk (over 85 per cent), it is a feasible and desirable civil defense option;

(*b*) see relocation as a practical and viable option to be used in conjunction with in-place planning to save the optimum number of lives during and attack; and

(*c*) think the problems addressed in this questionnaire are capable of solution if properly addressed by all levels of government.

Question 20. The committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

Answer. Please see the cover letter for the response to this question.

SOUTHERN CHAPTER,
CALIFORNIA EMERGENCY SERVICES ASSOCIATION
Riverside, Calif., January 5, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing and Urban Affairs, Room 5300, Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: I recently became aware of the fact that your committee is apparently inquiring into the Crisis Relocation concept as propounded by the Defense Civil Preparedness Agency. Simultaneously, I became aware of the questions which you had sent to some selected cities throughout the United States. Even though your questions were not directed specifically to me or to my jurisdiction, I am taking the liberty of providing you a set of answers.

I function as the Disaster Preparedness Director of the County of Riverside in California. Our population is somewhat in excess of 600,000 and the land area is 7,300 square miles. Significantly, under the DCPA concepts, parts of Riverside

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County would be at threat and other parts would act as host areas in the event of Crisis Relocation. Last year, there was a study conducted by a management consultant firm within California to inquire into the feasibility of Crisis Relocation. The question addressed was could Crisis Relocation be accomplished within the specified guidelines that were to be used in all other parts of the United States. These guidelines concerned time available for evacuation (72 hours), total distance traveled (200 miles) and hosting ratio (four to one). I was privileged to serve as a member of the steering committee which assisted the management firm in the preparation of the study. We discovered that despite its many problems, Crisis Relocation within California is feasible although could not be accomplished inside the specified guidelines.

Despite the above, I am, in fact, preparing my answers as the President of the Southern California Emergency Services Association. This Emergency Services Association is primarily a group of Civil Defense practitioners in Southern California. As such, we are concerned both with preparation for natural, as well as nuclear, disasters. As President, I feel that I am intimately aware with the problems, as well as the capabilities, of the many jurisdictions within Southern California.

I hope and trust that the answers to the questions which you have presented will prove to be of value to you in your deliberations. However, I would strongly request that your committee not determine that Crisis Relocation is not feasible or practical unless you would concurrently be able to recommend a product which would be sufficient to protect the population of the United States. Having studied the CIA report on Russian Civil Defense, those of us in the Civil Defense business now are of the opinion that we have given, perhaps unwittingly, to the Russians a significant strategic advantage when we allowed the Russians to develop their Civil Defense posture to the position which it now holds. I know that you are as interested in a viable Civil Defense program as I, and I would be pleased to be of any further assistance to you which you may require in this matter.

Respectfully submitted,

ROBERT J. HORRIGAN, *President.*

Enclosure.

POPULATION EVACUATION QUESTIONNAIRE SUBMITTED BY CALIFORNIA EMERGENCY SERVICES ASSOCIATION

Question 1. Do you now or have you ever had a population evacuation plan for your city? If so, for what purpose?

Answer. California law requires population evacuation plans for all populated areas below existing dams and reservoirs. Experience has forced many communities to develop evacuation plans for areas that might be regularly threatened by wildfires, mudslides, snowslides, etc.

Question 2. Is your plan applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. Currently, evacuation plans are concerned primarily with natural disasters; and for this reason, the plans concentrate on those areas that are so threatened rather than a blanket community wide evacuation plan. Many communities are aware of the proposed wartime evacuation plans, but they are awaiting guidance and instructions from the federal government before preparing such plans.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. Population evacuation plans are too expensive and too disruptive to the community to run a complete exercise or test. Some communities run mock exercises involving the governmental departments that would be connected with an evacuation if it were to actually take place. Many of the natural disaster evacuation plans have been tested in actual use; and in most of these instances, the results were very good.

Question 4. What position or office of your city government is responsible for population evacuation?

Answer. Both by tradition and by law, the law enforcement agency in most California communities is the agency responsible for population evacuation, although the planning may be prepared by some other office such as a Civil Defense office in that community.

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Question 5. How often are your population evacuation plans and operations being used by city officials, state or federal officials?

Answer. It is difficult to say how often evacuation plans and operations have been used, but it is appropriate to say that natural disasters in Southern California over the past several years have necessitated the use of one or more of these plans by one or more communities almost every year. In each case, city and/or county officials were involved; and in many cases, state officials were also involved.

Question 6. To what extent are federal, state and local governments included in your program planning?

Answer. State and local government actively participate in the planning process and in the operational activities when these plans are actually used.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. Typically, plans are developed using local funds in most cases. However, when such plans are prepared by a local Civil Defense official, more than likely his office expenses are supplemented by federal funds.

Question 8. What duties and responsibilities have been assigned to the various cities and government agencies? To private industries? To public utilities?

Answer. In most instances, evacuation actions fall within the law enforcement area of responsibility supported by fire departments, public works departments, local welfare departments, and public school districts all within the government framework. Within the public area, organizations such as the American Red Cross, Salvation Army, and many religious welfare groups have recognized capabilities and accept responsibilities for aiding in disaster plans; and such plans are usually integrated or coordinated with community evacuation plans. Public utilities in most cases are also included as participating agencies in the overall community disaster plan. and the utilities respond as the disaster situation requires. For example, all utilities are responsible and do take care of their own utility production and distribution system but in addition, for example the telephone company will set up additional phone capabilities in or near any disaster area in order to assist in the handling of that disaster.

Question 9. Do you have an Emergency Operating Center? What capabilities does it have? Is it in daily use?

Answer. Most communities have a designated Emergency Operating Center usually in daily use by the fire, police and/or civil defense offices in that community. Many of these Emergency Operating Centers, however, are not fully protected against wartime hazards. Most of them will provide, as a minimum, working space for direction and control activities and basic communications within the community.

Question 10. Is your evacuation plan coordinated with the plans of neighboring metropolitan areas and host areas?

Answer. The larger metropolitan areas coordinate their Civil Defense plans with coterminous communities to the extent deemed necessary. Natural disaster evacuation is usually more local in nature, and the need for coordination is not so vital. As mentioned earlier, wartime evacuation and host area coordination is waiting for federal governmental guidance and direction.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Answer. The State of California is currently investigating the subjects mentioned. Therefore, the travel distances, transportation requirements, etc., have not been delineated at this time. Local governments are waiting for the results of these studies and for governmental guidance before taking any further action.

Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. See response to item 11.

Question 13. Please discuss your logistical plans for supporting the evacuees, plans for food, water, medicine and sanitary supplies.

Answer. Although not yet developed, logistical plans for supporting evacuees will contain elements to provide for necessary supplies of food, water, medicine and sanitary provisions. Additionally it will be necessary to address such diverse items as parking and storage for transportation, the economy necessary to support the evacuated population and the protection of that population once it has been evacuated. It is interesting to know that preliminary studies do not in-

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dicate that water or sanitary supplies have ever been found to be a matter of overriding constraint.

Question 14. What are the plans for reuniting separated family units?

Answer. See response to item 11.

Question 15. What provisions are made for protection of property during and after evacuation?

Answer. See response to item 11.

Question 16. What nuclear radiation fallout protection is provided in the host area?

Answer. See response to item 11.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. See response to item 11.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be? Natural disaster/nuclear emergency? Dual purpose? Both?

Answer. The question and selected answers are confusing and appear to be redundant. However, any population relocation plan would of necessity address itself to the natural disasters that threaten a particular community and to the wartime evacuation depending upon the wartime risk that the community faces and the outcome of the California feasibility studies mentioned earlier.

Question 19. As mayor of one of the largest cities having to deal with transportation related problems:

(*a*) Do you think population relocation is feasible in a crisis situation?

(*b*) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

(*c*) Do you think the problems suggested by the previous questions have a practical solution?

Answer. As the president of the Southern California Emergency Services Association, which is synonymous with Civil Defense in this instance, I feel that population relocation is feasible although, granted, not easy. More importantly, I must ask the question, What other alternatives exist? Any solution, be it in-place shelter or population evacuation, would obviously increase the chances of population survival over the option of doing nothing; and these options will be all the more successful if the federal government would only provide positive leadership through a well prepared National Civil Defense Plan.

DEPARTMENT OF MILITARY AFFAIRS,
DIVISION OF DISASTER EMERGENCY SERVICES,
Golden, Colo., January 5, 1979.

Hon. WILLIAM PROXMIRE,
U.S. Senator, Room A-421, Senate Annex III,
Washington, D.C.

DEAR SENATOR PROXMIRE: Planners employed by the State of Colorado under contract with the Defense Civil Preparedness Agency have been involved in Crisis Relocation Planning for about four years. As you know, a Crisis Relocation Plan for the City of Colorado Springs as one of the selected proto-type locations was developed and appears to be generally favorably accepted by that City and the host areas identified for relocation of the population. The prototype planning developed a risk area plan, a single host county plan, a plan for sustaining essential risk area services and operations by City government, a plan for a State agency located in the risk area and a plan for a large community service private utility.

We were convinced that Crisis Relocation was feasible for Colorado Risk Areas and for two years have proceeded to develop plans in agreement with local officials and incorporating their considerable capability to execute the plans. Community and County elected officials have been briefed concerning the planning effort and appear to accept the logic of relocation and willing to work with the concept of either evacuating or hosting evacuees. State officials have been willing to support the planning efforts and key department capabilities and resources play a significant role in State direction and response plans.

Currently no plans are complete enough to be adopted by officials of the communities or counties involved. The State Plan for Nuclear Civil Protection—

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including Crisis Relocation—is being prepared and will be offered for review, changes and acceptance to State officials in the near future.

A Colorado Natural Disaster Emergency Operations Plan has been adopted within the last year as a result of a planning grant from the Federal Disaster Assistance Administration. This plan will be extended into modifications of the previously accomplished local and county civil defense planning during this year and in the future. Of course, the natural disaster planning does not encompass the magnitude of a large scale general evacuation of Crisis Relocation, but many of the response agencies and plans have a "dual use" capability which will be exercised in a natural disaster, a Community Shelter program, or in the Crisis Relocation concept.

Modifying local plans developed in the years of nuclear attack potential in which Community Shelter appeared the best answer, to include natural disaster preparedness and Crisis Relocation requires substantial planning efforts at every level of government.

We are enclosing replies to the questions you have posed concerning Crisis Relocation. The planning effort deserves substantial federal recognition and an increase in funding to provide timely production, implementation and exercising of critical elements of all disaster plans. Educating and training the populace in the desired response to emergency plans is a repetitive requirement and must be a broad based effort. This effort also deserves substantial federal emphasis and funding.

Thank you for the opportunity to comment concerning your inquiry.

Sincerely,

WILLIAM D. WELLER,
Major General, Colo. ARNG Director.

Enclosure.

ANSWERS TO SENATOR PROXMIRE'S QUESTIONNAIRE RELATING TO POPULATION EVACUATION OF DENVER METROPOLITAN AREA

Question 1. Do you now or have you ever had a population evacuation plan for your city? If so, for what purpose?

Answer. Yes, at one time during the late 1950s and early 1960s there was a paper plan for the tactical evacuation of downtown Denver. Its purpose was to show traffic routing, with police control and direction, and did not address hosting operations. Simply stated it was a plan to minimize the direct effects of a nuclear weapon in the core city. At this time the city has planned the capability to deal with localized natural and man-made disaster requiring only limited area evacuation. Under these plans Denver would take care of these evacuees.

Denver Civil Defense operations at this time are fallout shelter oriented; only rudimentary crisis relocation plans are available.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. No, there is no provision for the Mayor to explain a comprehensive total evacuation of Denver to the residents.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. No plan, therefore N/A.

Question 4. What division or office in your city government is responsible for population evacuation?

Answer. Denver Emergency Preparedness Office.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials?

Answer. City makes annual review of Westerly Creek Flood Plan with the Waste Water, Urban Drainage and Flood Control District. Other reviews are made with the City of Aurora, Lowry AFB and National Weather Service. Other contingency plans which may require evacuation of an area are reviewed with the emergency services on an annual basis.

Question 6. To what extent are federal, state and local governments included in your program planning?

Answer. Policy guidance from federal and state level, local government provides informal coordination.

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Question 7. What financial resources were used to develop your population evacuation plan?

Answer. P & A 50/50, with no special funds earmarked for CRP.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. See Denver Executive Order #85 for government responsibilities. Civil coordination is outlined in Master Denver City Disaster Plan.

Question 9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Answer. Yes. Staff support, communications with the public, and coordination with all Denver departments.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. Only with Aurora as regarding the Westerly Creek Flood Plan.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Answer. 350 to 450 miles. Primarily POVs with augmentation by RTD and DPS buses.

Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. 65 to 72 hours. Minimum of 14 days.

Question 13. Please discuss your logistical plans for supporting the evacuees (Plans for food, water, medicine, sanitary supplies).

Answer. Redirection of existing distribution systems.

Question 14. What are the plans for reuniting separated family units?

Answer. Not anticipated, due to I.R.; however, this is a traditional function of N.A.R.C. who will be involved at reception and/or registration centers in host areas.

Question 15. What provisions are made for protection of property during and after the evacuation?

Answer. Continued viability of the risk area, with fire and police service, to Support the relocation population, maintain other essential goods and services and limited stay put assistance.

Question 16. What nuclear radiation fallout protection is provided in the host area?

Answer. Planning for use of home basement, public fallout shelters, upgradable public fallout shelters, and expedient fallout shelters as necessary.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. Plan for 100% as in 16, above. CCF are counted at 100%.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: Natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Answer. Dual, although only a limited implementation on a localized basis may be necessary for most natural and man-made disasters in Denver.

Question 19. As mayor of one of the larger cities having to deal with transportation related problems:

(A) Do you think population relocation is feasible in a crisis situation?

Answer. Yes.

(B) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

Answer. Yes.

(C) Do you think the problems suggested by the previous questions have a practical solution?

Answer. Yes.

Question 20. The committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

Answer. Mayor should state that present resources (emergency preparedness staff) are insufficient and not available to accomplish the Crisis Relocation planning to the degree desired by the federal government. It therefore will be necessary for the federal government to provide more funding or other support to achieve this goal. The city can only look at the movement phase of relocation and then the viability requirements of the risk area.

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DEPARTMENT OF PUBLIC SAFETY,
JACKSONVILLE CIVIL DEFENSE,
Jacksonville, Fla., December 28, 1978.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing, and Urban Affairs,
Room 5300, Dirksen Senate Office Building,
Washington, D.C.

DEAR SIR: With regard to your questions relating to population evacuation of metropolitan areas, we respectfully provide you with the following:

Question 1. Do you now or have you ever had a population evacuation plan for your city?

Answer. Yes.

Question 1a. If so, for what purpose?

Answer. For both natural disasters and nuclear alert situations.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations?

Answer. Separate plans for each situation.

Describe the differences and how your plan deals with these differences.

Generally, natural disaster evacuation concerns itself with moving portions of our population from the coastal areas and/or from designated catastrophic areas throughout the county for chemical spills, etc. This natural disaster type of evacuation involves emergency movements within the county borders and does not plan for supply and material redistribution.

Our Crisis Relocation Plans for Nuclear Civil Preparedness plans (CRP-NCP) to move the majority of the population outside the borders of the county to the surrounding ten counties and is greatly involved in redirection of supplies materials, money, etc.

Question 3. If you have a population evacuation plan, has it ever been tested?

Answer. Natural Disaster Plans—Yes, Nuclear Crisis Relocation Plans—No.

Question 4. What Division or Office in your city government is responsible for population evacuation?

Answer. The Civil Defense Division.

Question 5. How often are your population evacuation plans and operations reviewed by City officials, State or Federal officials?

Answer. Our Nuclear Crisis Relocation Plans have not, as yet, been reviewed or approved by State or Federal officials; consequently, have not been officially presented to City officials.

Question 6. To what extent are Federal, State and local governments included in your program planning?

Answer. Our Nuclear Crisis Relocation Plans currently are solely dependent upon local government action since neither the State or Federal governments have published a formal nuclear alert plan.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. The Civil Defense Division's normal annual budget.

Question 8. What duties and responsibilities have been assigned to various City government agencies and to private industries and public utilities?

Answers. Generally, emergency extensions of their normal day-to-day activities.

Question 9. Do you have an emergency operating center?

Answer. Yes.

Question 9a. What capabilities does it have?

Answer. Protection and operational capabilities for heads of government and its major agencies.

Question 9b. Is it in daily use?

Answer. Yes.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. No, neighboring risk and host areas have not completed any corresponding or supporting evacuation plans.

Question 11. What distances will the evacuees have to travel to host areas?

Answer. Minimum of 20 miles to a maximum of 90 miles.

Question 11a. What types of transportation are planned/provided for evacuees?

Answer. Primarily, private autos supplemented by public transportation authority buses.

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Question 12. How much time is required to evacuate your city to the host area?

Answer. An estimated maximum of fourteen (14) hours.

Question 12a. For what period of time do you expect the evacuees to remain in the host area?

Answer. Two (2) weeks maximum.

Question 13. Please discuss your logistical plans for supporting the evacuees (Plans for food, water, medicine, sanitary supplies).

Answer. In lieu of State or Federal guidelines and supporting host area plans, primary support must originate with directions to each individual evacuee that "if you don't take it, you won't have it". Bulk redistribution must eventually be coordinated to include a wide area of north Florida and south Georgia as now covered in normal day-to-day operation.

Question 14. What are the plans for reuniting separated family units?

Answer. A function assigned to Red Cross and the Salvation Army.

Question 15. What provisions are made for protection of property during and after evacuation?

Answer. Minimal essential manpower will commute from host to risk area on twelve (12) hour shifts to maintain essential services including law enforcement.

Question 16. What nuclear radiation fallout protection is provided in the host area?

Answer. Generally, inadequate protection to care for the normal resident population.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. None, this assignment is a function of the host areas not yet accomplished.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: Natural disaster, nuclear emergency of dual purpose?

Answer. Not applicable.

Question 19. A. Do you think population relocation is feasible in a crisis situation?

Answer. Yes, it appears to be the best alternative to a national blast shelter program, at least for the Jacksonville, Florida area.

B. Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

Answer. Positively. Not the best, but a relatively inexpensive alternative.

C. Do you think the problems suggested by the previous questions have any practical solution?

Answer. Absolutely, excluding, perhaps, a few of the most heavily populated megalopolises.

Question 20. Additional comments.

Answer. If a national policy of Crisis Relocation for Nuclear Civil Preparedness becomes accepted doctrine, it must be supported with sufficient resources to accomplish the end product just as soon as possible.

It must be recognized that the City of Jacksonville consolidated with Duval County in 1968. The above questions are answered in light of that local government consolidation wherein the City and the County are essentially one and the same entity and have jurisdiction basically over the same land area.

Sincerely,

R. F. BLODGETT, *Director.*

STATE OF GEORGIA,
DEPARTMENT OF DEFENSE,
CIVIL DEFENSE DIVISION,
Atlanta, Ga., December 22, 1978.

Hon. WILLIAM PROXMIRE,
Vice Chairman, Joint Committee on Defense Production,
Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: Reference your questionnaire concerning population evacuation of metropolitan areas that was sent to twenty (20) metropolitan area mayors. Mr. George Rodericks, Director, District of Columbia Office of Emergency Preparedness, has indicated that you would also appreciate comments on the questions from State Directors of Civil Defense. Georgia responses are attached with each answer keyed to the original question number.

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Georgia welcomes the chance to comment on this vital national program and if we can be of further assistance, please advise.

Sincerely,

BILLY M. JONES,
Major General, Director

Attachment.

POPULATION EVACUATION OF METROPOLITAN AREAS

1. Georgia has developed three (3) types of population evacuation plans. They are: Crisis Relocation Plans (CRPs) for ten (10) DCPA identified nuclear target areas, the Coastal Georgia Hurricane Evacuation Plan involving 29 counties (six coastal and 23 inland) located on or near the Georgia coast, and evacuation plans for those and adjacent counties that have nuclear fixed facilities.

2. Evacuation procedures in all plans involve basically the same evacuation procedures.

3. Population evacuation plan tests have been conducted in selected Georgia communities. (Hurricane Evacuation Plan, August 1977; CRP, December 1978)

4. The Georgia Department of Defense, Civil Defense Division, upon direction of the Governor, is responsible for population evacuation.

5. State population evacuation plans remain under constant review with updates not less than annually.

6. All levels of government (federal, state and local) are included in the planning process. Using federal guidance, state planners in concert with local officials, develop the actual plans. Workshops, public officials conferences, and on-site assistance meetings are also utilized to develop local involvement.

7. Crisis Relocation Plans are 100 percent financed by DCPA funds. The Coastal Georgia Hurricane Evacuation Plan was financed by Federal Disaster Assistance Agency (FDAA) funds. Additional planning support is provided by state and local personnel that are partially financed by their own internal department or community funds.

8. All state agencies in Georgia have been tasked with primary and support missions to Civil Defense in the event of emergencies or disasters of any type. All local plans task local agencies and departments of city and county government. Agreements of mutual support have been developed between government and the private sector.

9. The State of Georgia maintains a 24 hour nuclear hardened Emergency Operating Center that has a complete radio and telephone communication facility. Additionally, the State Civil Defense maintains a Mobile Command Post that provides an on-site command and control unit for disaster operations. Also, six partially hardened area communications centers are located within the state.

10. All evacuation plans have been coordinated with appropriate metro and host areas.

11. Evacuation distances vary from five to 100 miles (approximate), Privately owned vehicles (POVs) are tasked as the primary source of transportation with county controlled school buses and other public transportation being utilized for transportation of individuals without personal transportation.

12. Under guidelines provided by DCPA, Crisis Relocation Plans have a three day (72 hours) evacuation time after Presidential declaration. Hurricane evacuation plans require complete evacuation within 24 hours. Nuclear facility evacuation is instantaneous. Time in host area varies from an undetermined time for hurricane evacuees to two (2) weeks for Crisis Relocation.

13. Due to the lack of national guidance, plans for food, water, medicine and sanitary supplies for evacuees have not been completely developed for Crisis Relocation Plans. Other evacuation plans, due to the limited number of evacuees, use the capabilities of the state agencies and private relief organizations (Red Cross, Salvation Army, etc.) to provide the logistical support required.

14. All plans evacuate families as a single unit. For essential personnel that cannot evacuate with the general population, predetermined shelter facilities are identified for family reunion.

15. In a nuclear threat environment (CRP), state and local (stay behind) police personnel are used for property protection. In a natural disaster, police plus National Guard units are utilized.

16. Host area fallout protection, in most cases, will depend on evacuees "self-help" to upgrade shelter facilities to a acceptable protection factor.

17. All evacuation plans consider 100% risk area population evacuation.

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18. If Georgia did not have evacuation plans, the focus would be on both types of plans, nuclear and natural.

19. a. Yes, with proper national guidance and support; b. Definitely yes; c. Yes.

20. Evacuation plans for both nuclear and natural disasters or threats have the ability to save the lives of countless individuals. Both options of nuclear protection, Crisis Relocation and Community Shelter, must be considered. Congress must address the Shelter Stocking Program and provide the requested national level support and funding.

DEKALB COUNTY POLICE DEPARTMENT,
Decatur, Ga., January 2, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing, and Urban Affairs, Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR: The following comments are keyed to questions posed in the 202050z December 78 message from the District of Columbia Office of Emergency Preparedness to the Director of the Defense Civil Preparedness Agency. In a 221628z December 78 message to DCPA Region III, State Directors were advised that non-addressee local officials could respond to the question if they so desired.

Question 1. Do you now or have you ever had a population evacuation plan for your city? If so, for what purpose?

Answer. A county evacuation plan has been prepared for DeKalb County, Georgia. This primarly urban county is a part of the metropolitan Atlanta complex and contains approximately 500,000 persons. The evacuation plan was prepared to meet the needs for evacuation in the event of a national emergency involving the threat of nuclear disaster or for use in widespread area natural disaster.

Question 2. Is your plan equally applicable to Natural Disasters and Nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. One plan was developed for natural and nuclear disaster.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. The evacuation plan has not been tested nor are there present intentions to do so.

Question 4. What division or office in your city government is responsible for population evacuation?

Answer. Civil Defense (Police Department) is responsible for population evacuation.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials?

Answer. Local plans are reviewed and updated on a yearly basis. State Civil Defense and local officials are provided copies of these plans.

Question 6. To what extent are federal, state and local governments included in your program planning?

Answer. Most local government departments/agencies are directly involved in the execution of local preparedness plans. State agencies are expected to provide a second level of support when local resources are expended. When a Presidential Emergency is declared, Federal Departments/Agencies are expected to take the lead in restoring things to normal by implementing the authorities contained in PL 93-288 for Federal Disaster Assistance.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. The paid full time Civil Defense Staff for DeKalb County is one Civil Defense Officer and one Secretary.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. The various county departments are expected to continue to perform their assigned peacetime duties during emergency/disaster situations. Where this is impossible because of the nature of their routine functions, they have been realigned as a workforce in support of other departments. As an example,

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the Sanitation Department is assigned to assist the Roads and Drainage Department in keeping open the country roads and bridges, and for debris clearance. Private industry and public utilities will be expected to support the governmental activities/goals in a restricted environment.

Question 9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Answer. DeKalb County does have an Emergency Operating Center in the basement of the Courthouse. It is capable of offering a high radiological protection factor, emergency power, limited water supply, and filtered air. It is in daily use by personnel from several county departments/offices.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas.

Answer. Yes, the basic guidelines for evacuation were developed and coordinated by Georgia State Civil Defense.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Answer. Evacuees from DeKalb County will relocate in areas from 20 to 75 air miles from their homes with an average of about 50 miles. Transportation will be primarily by privately owned vehicles but arrangement for use of available school buses have been completed.

Question 12. How much time is required to evacuate your city to the host areas? For what period of time do you expect the evacuees to remain in the host area?

Answer. Evacuation can be expected to take at least three days and evacuees are to be told to prepare to exist away from home for at least two weeks.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

Answer. During the build-up phase of national emergencies local distributors/wholesalers will be instructed to redistribute existing supplies to the host areas, since that is where the population/user will be rather than in the usual metropolitan area. Priorities for resource utilization have been established and will be instituted as necessary.

Question 14. What are the plans for reuniting separated family units?

Answer. Host county personnel reception stations have been designated. Evacuee inprocessing at these locations should aid in reuniting separated families.

Question 15. What provisions are made for protection of property during and after the evacuation?

Answer. The essential workforce available within the risk area will include most government employees. Of special importance will be the Police/security personnel who will oversee the security of property left behind by evacuees.

Question 16. What nuclear radiation fallout protection is provided in the host area?

Answer. Existing fallout shelter facilities are not as common in the host area as they are within this county. However, evacuees would be farther away from the risk area and less likely subjected to blast effects and high radiation levels. Since time and distance affect radiation levels, our citizens are better off out of the risk areas if sufficient warning time is available.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. All citizens of DeKalb County have host areas designated where they can relocate.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Answer. Dual purpose is the focal point in the preparation of all DeKalb County plans. The likelihood of a natural disaster is greater than a nuclear emergency, and therefore testing of plans is reasonable and timely.

Question 19. As Mayor of one of the larger cities having to deal with transportation related problems: (a) do you think population relocation is feasible in a crisis situation?

Answer. Population relocation in light of our existing transportation problems may be impossible; however, in an emergency situation, with adequate planning, timely emergency public information, and a cooperative public spirit, it can be a viable alternative to inplace sheltering.

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Question (*b*). Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

Answer. Yes, because a larger percentage of the population has been relocated to less hazardous areas. Living conditions may be deplorable, but survivability is the key.

Question (*c*). Do you think the problems suggested by the previous questions have a practical solution?

Answer. Yes, continuous planning and greater public awareness can lead to practical solutions for these complex problems. What the locals need are a congress willing to support the preparedness programs with an adequate budget and an expanded public information program to make our citizens aware of their role in disaster preparedness.

Question 20. The Committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

Answer. Comments: The population evacuation program is another alternative to be explored in the enhancement of our defensive posture. Granted we cannot be as successful in our execution of these plans as a totalitarian government, but it is somewhat defeatist to say area evacuation won't work. It will work, it must work in order to carry on the way of life we seek to preserve. In its dual capable role, any planning and expenditures for natural disaster will have immediate application in time of nuclear emergency. Crisis relocation can be an effective program and should be continued.

Sincerely,

GEORGE W. BROOKS,
Civil Defense Officer,
DeKalb County, Ga.

STATE OF HAWAII,
DEPARTMENT OF DEFENSE,
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE,
Honolulu, Hawaii, December 26, 1978.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing and Urban Affairs, Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: Since crisis relocation planning is being accomplished at the State level in Hawaii and the Mayor of the City and County of Honolulu (one entity) has not been involved in this planning to date, we feel that we should reply to your inquiry.

Today, crisis relocation planning has progressed to the point where a transportation feasibility study has been completed, allocation of the population has been completed and a draft State plan is half completed. Planning at the county level has not started.

The following reply is furnished to your twenty questions. For brevity, the questions are not repeated.

1. The City and County of Honolulu and the Island of Oahu are one and the same. No previous evacuation planning has been conducted.

2. The plan being developed for crisis relocation does not appear to be valid for a natural disaster except as noted in paragraph 18.

3. Not applicable.

4. Within the City and County, the Oahu Civil Defense Agency will have primary responsibility for crisis relocation.

5. Concurrent with development.

6. The State level plan being prepared currently will involve State, Federal and County governments.

7. Planning for crisis relocation is currently being done by one planner and a half-time clerk-stenographer using Federal funds.

8. Planning to date envisions the County Civil Defense Agencies operating County Emergency Operating Centers with representatives of major County agencies present. Heavy responsibilities fall on the Department of Transportation Services to provide ground transportation of evacuees and police for traffic control and security.

9. Yes. The County has an Emergency Operating Center which has communications to all emergency services and is in the warning network. It has a protection factor of over 3,000 and a 14-day supply of food, fuel and water, emergency power,

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displays and maps. It is within the Civil Defense office, is used during daily working hours and manned 24 hours a day during emergencies.

10. Crisis relocation planning is being coordinated with all counties and agencies by the State level planner.

11. Evacuees will have to travel 100 to 200 miles. Movement begins using city buses to carry evacuees to the airport and ports where they will board interisland air and sea transportation. Private pleasure boats will be utilized for a one-way trip by owners and crew.

12. The evacuation is scheduled for seven days and will remove approximately half of the population from the high risk area on Oahu. Evacuees are expected to stay a minimum of one week in the host area. Maximum stay cannot be predicted.

13. Logistics planning has not been completed but will involve movement of supplies from high risk to host areas.

14. Families are expected to relocate together.

15. Evacuation will not be complete. Normal police patrols will watch for personal property left behind.

16. Evacuees would be utilized to upgrade previously designated structures into fallout shelters.

17. There is a shortage of fallout shelters in the host areas for local residents. Evacuees and local residents will have to work together to upgrade shelter for use by both groups.

18. Primarily nuclear. The plan could also be used following a major natural disaster to coordinate transportation and provide housing and care for the homeless.

19. (A) The State plan is being prepared based on known transportation constraints and therefore feasible.

(B) Yes.

(C) Yes.

20. It is recognized that crisis relocation is not a total solution, however, any movement of personnel out of the target area has to improve the survivability rate. Time is seen as the key element to its success. Existing shelter plans for the risk area will remain available should time not be available and for those left behind.

Sincerely,

VALENTINE A. SIEFERMANN,
Adjutant General,
Director of Civil Defense.

MECOSTA COUNTY OFFICE OF CIVIL DEFENSE,
MECOSTA COUNTY SHERIFF DEPARTMENT,
Big Rapids, Mich., January 31, 1979.

(Attention: Peter R. Basolo).

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing, and Urban Affairs, Dirksen Senate Office Building, Washington, D.C.

DEAR SIRS: Our County has been designated as a host area for parts of Oakland County, which under good weather and driving conditions, is approximately a four (4) hours drive.

Our County is aslo a rural area of 576 square miles and only about 40,000 population of low income, with small and older homes and small stores. The nearest warehouse, where any amount of food could be obtained is Grand Rapids, Mich., which is approximately 60 miles to the south of us. We have one (1) main highway going through our County which is US-131, which is an old two (2) lane highway and runs parallel with the Muskegon River.

Because of the fact that the river runs parallel with the highway, when the road becomes blocked, all traffic comes to a complete stand still, and I can assure you that if several thousand people started to evacuate to the north the road would soon become completely blocked with accidents, lack of gas, etc. At that time it would become impossible to receive provisions from the south. Therefore, if the people were able to get to the area we would not be able to house and feed them.

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It is further my opinion that relocation as now planned is not practical and impossible to make work.

The only system that I could visualize as working at this time, would be a volunteer type, where a person in a Host Area would volunteer space for X number of people (e.g., a family of four). Then a family of that size would be assigned to the volunteer and they should start a pen pal type relationship, and if possible visit their host family, however, most people in the host area have family or friends in the risk areas, therefore, I'm sure any space they may have will be reserved for them.

Respectfully yours,

Lt. JAMES F. STOCKWELL, E.S.C.,
Mecosta County Sheriff Department.

DEPARTMENT OF STATE POLICE,
EMERGENCY SERVICES DIVISION,
Lansing, Mich., January 18, 1979.

Subject: Crisis Relocation Program.
Attention: Local emergency preparedness coordinators/directors.

Recently, the Honorable William Proxmire, Chairman, Senate Committee on Banking, Housing, and Urban Affairs, requested that officials of twenty of our largest cities respond to a series of questions concerning crisis relocation and local evacuation planning. As a result of the initial response, the Defense Civil Preparedness Agency has been asked by the Committee to solicit from all states and political subdivisions additional comments and inputs concerning this subject so that related views may be considered. The following questions are the basis of the inquiry:

1. Do you now or have you ever had a population evacuation plan for your city? If so for what purpose?—No.
2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.—Not available.
3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?—Not available.
4. What division or office in your city government is responsible for population evacuation?—Civil Defense.
5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials?—Not available.
6. To what extent are federal, state and local governments included in your program planning?—Not available.
7. What financial resources were used to develop your population evacuation plan?—Not available.
8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?—Not available.
9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?—1--Yes. 2—Radio communication with all emergency units of government. 3—Yes.
10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?—Not available.
11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?—Not available.
12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?—Not available.
13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).—Not available.
14. What are the plans for reuniting separated family units?—Not available.
15. What provisions are made for protection of property during and after the evacuation?—Not available.
16. What nuclear radiation fall-out protection is provided in the host area?—Not available.

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17. What percent of the population covered in your plan has designated shelter areas?—Not available.

18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: Natural disaster, Nuclear Emergency or dual purpose (both natural disaster and nuclear emergency)?—Dual purpose.

19. As mayor of one of the larger cities having to deal with transportation related problems:

(a) do you think population relocation is feasible in a crisis situation?—No.

(b) do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?—No.

(c) do you think the problems suggested by the previous question have a practical solution?—No.

20. The committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

All replies to the above questions should be directed by January 31, 1979, to: The Honorable William Proxmire, Chairman, Senate Committee on Banking, Housing, & Urban Affairs, Room 5300, Dirksen Senate Office Building, Washington, D.C.

PETER R. BASOLO,
Captain, Deputy State Director of Emergency Services.

STATE OF MINNESOTA,
DEPARTMENT OF PUBLIC SAFETY,
St. Paul, December 29, 1978.

Senator WILLIAM PROXMIRE,
U.S. Senate,
Washington, D.C.

DEAR SENATOR PROXMIRE: Thank you for giving us the opportunity to respond to the twenty questions relating to population evacuation of metropolitan areas.

The State of Minnesota has always developed civil defense plans along the line of a possible nuclear attack upon the United States. In the early sixties, most large cities in the state had an evacuation plan to get the people out of the cities. The idea was to save as many lives as possible.

After the Cuban Crisis of October, 1962, emphasis was placed on locating shelters which would protect the citizens from radioactive fallout. The shelters were stocked with survival supplies for a two week austere type of survival. This was referred to as "in place" community shelter plans.

Today both of these options are very much of the Minnesota emergency planning effort. Only the option of relocating goes further than just evacuating the cities to the county. Today's plans provide for congregate care, feeding and sheltering the evacuee.

The Minnesota Division of Emergency Services has contracted with the Defense Civil Preparedness Agency to help promote and develop emergency plans at the local level.

To answer questions relating to the population evacuation of metropolitan areas in the State of Minnesota, each question will be answered separately.

1. Yes. Minnesota is in the process of developing population evacuation plans for the purpose of saving as many lives as possible in a nuclear confrontation.

2. The State of Minnesota natural disaster planners and nuclear civil protection planners have developed one plan to cover all emergencies.

3. The emergency plans are being tested yearly at state level through region exercises. The local plans are exercised through a tabletop exercise and emergency simulation exercise, where each service chief is fed problems to see if he has covered them in his plan. We have tested on small scale evacuation for floods, chemical accidents and forest fires.

4. The civil defense director is responsible to initiate the plan under certain defense readiness conditions.

5. The State of Minnesota has a policy whereby each county and local official has to update part of his emergency plan each year, rotating from the basic part of the plan to the annexes the following year.

6. Federal guidance from the Defense Civil Preparedness Agency was used in the development of the state and local plan.

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7. The State Emergency Services Division contracts with the Defense Civil Preparedness Agency for a nuclear civil protection planner who works in the counties throughout the state helping civil defense directors to develop a plan.

8. All government agencies have been assigned emergency responsibilities, such as law enforcement, traffic control and security. Plans are in the process of being developed in public utilities and private industries to coincide with the all emergency planning.

9. The state has an Emergency Operating Center located in the basement of the Capitol, which is used on a daily basis covering all hazards. One staff member per week has the assignment of duty officer on a 24-hour basis to coordinate any disaster in the state. Most counties either have in use on a daily basis an E.O.C. (Emergency Operating Center) or are having one designed into new law enforcement facilities.

10. All evacuation plans are coordinated with both the risk and host counties.

11. The average travel to a host area will be 100 miles or less in Minnesota.

12. The time required to evacuate most of the metro area is estimated to be about 12 hours. This may, however, be spread over several days.

13. Plans for feeding, health problems and sanitary supplies are part of the annexes to the basic emergency plan. Host areas will provide mass feeding centers, relocated nurses and doctors to improve the local medical staffs.

14. The essential worker and his family will be sheltered on the perimeter of the risk area. It is in the plan for the essential worker to communicate to host area.

15. Property will be looked after by the law enforcement and fire departments, who are considered as part of the essential work force. The main job will consist of security and fire watch. A pass system has been developed so only key personnel will be in the risk community.

16. The host area and its evacuees will have nuclear radiation protection by upgrading buildings into shelters according to the engineering annex of the emergency plan.

17. All citizens of the host area and evacuees are assigned shelter space.

18. Minnesota has a dual purpose plan to be utilized in all emergency situations.

19. The Minnesota Emergency Services Division feels that crisis relocation will work because we have the room in neighboring counties to evacuate the citizens into.

Transportation plans have developed the idea of using one family car, city and schools buses.

The question "do you see relocation as a practical solution"? This, we feel, is the best option under the present circumstances. We can only make these assumptions and give our citizens the option of relocating.

In natural disasters, such as tornadoes, snowstorms and floods, we see the willingness of citizens to accept his neighbor or a stranger who needs help. Why should we Americans react any differently under a nuclear disaster?

There is no doubt in my mind that we have to expect a certain percent who will not move and plans need to include information on how to improvise fallout protection in their own home.

We need to look at Civil Defense as part of our defense posture. Without it we are short changing the citizens for whom we have accepted the responsibility to protect on all levels.

Thank you for giving us the opportunity to respond to your questions.

Sincerely,

ROGER FRANKE,
Director.

MISSISSIPPI CIVIL DEFENSE COUNCIL,
OFFICE OF EMERGENCY PREPAREDNESS,
Jackson, Miss., January 4, 1979.

HON. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing and Urban Affairs, Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: This letter is in reply to a teletype message concerning population evacuation signed by George R. Rodericks, Director, District of Columbia Office of Emergency Preparedness.

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The attached are comments on the twenty questions from a State standpoint. If any additional information is desired, please contact this office.

Sincerely,

BILLY REX SHORTER,
Director.

Enclosure.

1. a. All of our coastal counties and several other counties have evacuation plans for their areas.

b. The coastal counties plans are for hurricanes, hazardous materials incidents, and crisis relocation.

c. The other counties' plans are mostly for hazardous materials incidents and crisis relocation.

2. In most cases, most of the plans are for both, however, under nuclear disasters, areas of safety is further away and for a longer time of stay than in a natural disaster.

3. a. Several counties periodically test their plans, however, in some cases the testing is putting the plan in effect: Hurricane Warnings, Hurricane Watches, Hazardous Materials Incidents.

b. Shows the area of the plan that is weak and needs revising.

4. Civil Defense (Emergency Services).

5. a. Every year.

b. Every two or three years.

6. Information is requested by each level of government.

7. Except for printing and compiling the plans, none.

8. Each department and/or Agency has been given particular assignments which they are familiar with, i.e., police department—traffic control and security. It is the same with private utilities.

9. a. Yes, the State Emergency Operation Center is located in Jackson, Mississippi. Also, we have approximately 24 County or City EOC's within the State.

b. The State Center has the capability of communicating with:

1. Region Three, DCPA, Thomasville, Georgia (Radio and Teletype).
2. Most of the State Agencies (Radio).
3. All County or City EOC's which have radio capability (Radios and NAWAS).

c. The State Center is operational on a daily basis with a duty officer on call 24 hours a day. (24 Hour Operation).

10. In most cases the plans are coordinated and a mutual aid agreement has been established either written or verbally.

11. a. The average distance will be 50 miles, the maximum will be 125 miles.

b. Private vehicles and public school buses.

12. a. Approximately 24 hours.

b. 1–3 weeks.

13. Plans for supporting the evacuees will be the same as any other plans of evacuation. Each local area will be expected to take care of the evacuees with the existing resources in their area. This will be supported by the evacuees bringing their own supplies to help until other needed resources can be relocated to take care of the demand. Plans are being developed to redistribute resources.

14. Separated family units can be reunited by contracting the Reception Centers in the Host Area for information.

15. Provisions are made for protection of property by commuting personnel used for security.

16. Percentage of population covered by fallout protection statewide:

1. Residents about 25 percent.
2. Evacuees about 10 percent.
3. Through upgradeable and expedient shelters.

17. 30 percent.

18. Dual purpose.

19. a. Yes.

b. Yes.

20. There is a great need:

c. Yes.

1. Survey all building in every county.
2. For all new construction to incorporate the slanting technique in the design.

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3. For a Federal-State law which would require that all buildings be built to provide fallout protection for its occupants.

[TELEGRAM]

GEORGE E. MCAVOY,
DIRECTOR, NEW HAMPSHIRE STATE CIVIL DEFENSE,
December 29, 1978.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing, and Urban Affairs, Washington, D.C.

FOLLOWING REPLIES FOR THE STATE OF NEW HAMPSHIRE AND ITS 235 TOWN AND CITIES, NUMBERED PER YOUR TWX OF DECEMBER 20, 1978

Question 1. Do you now or have you ever had a population evacuation plan for your city? If so for what purpose?

Answer. Informal plans exist in several communities for flood plain and seacoast evacuation. In addition, a limited number of communities have informal plans for small area evacuation of industrial hazard areas. The New Hampshire State Emergency Plan, Annex D, established State-level policy for evacuation.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. The Nuclear Civil Protection Plan, now under development, addresses the question of evacuation in detail, and will become a part of the overall State Emergency Plan at a later date.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. Table-Top exercises have been conducted in several communities. Actual disasters have, of course, provided their own tests of plans. No loss of life has to be the criteria of the success of plans.

Question 4. What division or office in your city government is responsible for population evacuation?

Answer. State Civil Defense at state-level. Usually Civil Defense at Local level, however, some variations. In accordance with Chapter 107, R.S.A., The Civil Defense Act.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials?

Answer. At least annually.

Question 6. To what extent are federal, state and local governments included in your program planning?

Answer. State Civil Defense is coordination point for local disaster planning. FDAA and DCPA are directly involved through State C.D. Each community must have a local emergency plan and Emergency Communications Development Plan.

Question 7. What financial resources were used to develop your population evacuation plan

Answer. DCPA matching funds, DCPA NCP planning funds, FDAA natural disaster planning grant, state funds, and local funds.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. Various assignments at local level, primarily C.D., police, fire, Red Cross, and schools. At state-level, primary assignments as follows.

Coordination: State Civil Defense.
Transportation: Adjutant General, Aeronautics, Education, Highway.
Traffic control: Highway, State Police.
Communications: State Police.

Question 9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Answer. State-level EOC is state civil defense headquarters, in daily use. Capabilities include emergency power and communications. Various EOC's at local level, mostly in local fire or police stations.

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Capabilities at the State EOC are extremely limited as this is not a full communications center. The new "Emergency Satellite Communications System," will enhance the EOC but still is short of total coordination capability.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. NCP Plan, upon completion, will provide for full coordination not only between areas, but between states as well. New Hampshire serves as a hosting area for large numbers of people from Eastern Massachusetts and Rhode Island.

The communities and States involved are aware of their host area assignment in New Hampshire. Planners efforts are coordinated.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Answer. Maximum interstate travel, 200 miles. All surface means of travel will be utilized.

Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. In a nuclear attack threat situation, planning follows nations guidelines.

I.E., three days evacuation time; stay-time of two weeks or more.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

Answer. NCP plans not developed to this stage at this time.

Question 14. What are the plans for reuniting separated family units?

Answer. NCP plans not developed to this stage at this time.

Question 15. What provisions are made for protection of property during and after the evacuation?

Answer. NCP plans call for a risk area minimum police force to maintain security.

Question 16. What nuclear radiation fall out protection is provided in the host area?

Answer. Inherent fallout protection in existing buildings and residential basements. Additional expedient shelter to be developed as such time as crisis relocation is instituted.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. No firm figure available at this time, however, insufficient existing shelter will exist thereby requiring some reliance on expedient shelter methods.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Dual purpose.

Question 19. As Mayor of one of the larger cities having to deal with transportation related problems:

(a) Do you think population relocation is feasible in a crisis situation?

(b) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

(c) Do you think the problems suggested by the previous questions have a practical solution?

New Hampshire is not sufficiently advanced in the NCP planning process to reflect an accurate picture of local opinion, however, feedback to date indicates that local government officials see the NCP planning process as being preferable to no planning at all.

Question 20. The Committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

It is obvious with the world situation deteriorating in many areas and extremely sensitive in other areas that protection of the civilian population and protection of the critical industrial population in place should receive priority consideration. This state also considers the resources management portion of this plan to be vital to both natural and nuclear disaster situations.

GEORGE E. MCAVOY,
Director, New Hampshire State Civil Defense.

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SUMMIT COUNTY PLANNING DEPARTMENT,
Akron, Ohio, January 2, 1979.

Re: Answers relating to Population Evacuation Planning, as solicited by Honorable William Proxmire, Chairman, Senate Committee on Banking, Housing and Urban Affairs.
Re: Evacuation planning.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing and Urban Affairs, Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: There are several of the areas of questioning that need address in regards to the viability of civil defense programming in the United States.

They include:

1. Standardized State Legislation.
2. Standardization of local government planning and activities.
3. Facilitating the flow of Excess and Surplus federal property to local governments (such as generators, trucks, heavy equipment and back up supplies for such equipment).
4. Reviewing the mechanisms through which DOD property is diverted to private equipment brokers.
5. Proper enforcement of standardized operating procedures; and,
6. The constant reorganizing of federal civil defense.

In regards to your specific questions about evacuation planning though, perhaps the following comments will be helpful:

Expending great sums of federal dollars on evacuation planning in the United States would support a great number of civil defense planners, but unless the previously outlined questions (no's 1, 3, 5 & 6) are addressed a practical solution to such a massive problem cannot soundly be suggested.

Even in the theoretical scenario of massive relocation of urban dwellers, some pre-topic questions should be reviewed by the Committee on Banking, Housing and Urban Affairs before making allocations or recommendations. They are:

1. What disruptive policies could prevail if the United States follows suit to the USSR's utilization of the general population as pawns in international problem solving?
2. Can we afford to divert funding from the well-established military responsibility into the fragmented civil defense network?
3. Our military establishment, by its nature is committed to war defense. Should our civil planning become committed to the degree suggested by solidifying massive evacuation procedures?; and,
4. In the spirit of progress, shouldn't we be more involved in funding activities that can capture the imagination of instead of the fears of countries throughout the world?

Respectfully yours,

EUGENE A. MARTIN,
Administrator, Summit County Disaster Services.

THE CITY OF OKLAHOMA CITY,
DEPARTMENT OF SAFETY AND EMERGENCY SERVICES,
December 27, 1978.

To: Hayden Haynes, Director, Oklahoma Civil Defense.
From: Clyde W. Mitchell, Director, Safety and Emergency Services.
Subject: Evacuation plans for metropolitan areas.

Pursuant to the TWX from George Rodericks, Director of District of Columbia, Office of Emergency Preparedness, to Hayden Haynes, President NASDDP, the following information is submitted:

1. Oklahoma City/County has a Population Evacuation Plan. The primary purpose of this plan is to disperse the population in the event of an imminent nuclear attack.

2. Parts of the Evacuation Plan are applicable to natural disaster and nuclear alert situations. The plans can also be applied in other man-made contingencies such as chemical spills. The major difference is number of evacuees and the distance which they will be required to move.

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3. The movement of the population from the Oklahoma City area has not been tested, however from experience gained by moving more than 50,000 people out of the city between 4 and 6 p.m., five days per week, we feel it is feasible to move the entire population. Two exercises have been conducted involving the 14 host counties and a series of Table Top Exercises are scheduled in January 1979 for the Risk Area Officials.

4. The responsibility for evacuation of the Oklahoma City/County Area rests jointly with the Governor, the Oklahoma County Commissioners and the Mayors of the municipalities in the risk area.

5. The contingency plans for the Oklahoma City Metropolitan Area are reviewed and updated on a two year basis. Parts of the plan, i.e. emergency call lists and resources lists, are updated every six months. The State Liaison Officers are made aware of these updatings and furnished copies, also the Federal Regional Office is kept abreast of these updatings.

6. All planning at the local level is closely coordinated with State, Federal and Local Governments. The Evacuation Plan for Oklahoma City/County was a joint effort of Federal, State, County and City Planners.

7. Financial resources in developing the Oklahoma City/County Evacuation Plans came from federal, state, county and city sources.

8. For assignment of duties and responsibilities see the Index to the Evacuation Plan.

9. Both the City of Oklahoma City and the Oklahoma State Civil Defense Agency have hardened EOCs in Oklahoma City. Both are used daily and the City EOC maintains a 24 hour operation.

10. The nearest Metropolitan Area to Oklahoma City is Tulsa, Oklahoma, which is a distance of approximately 125 miles. Our plans have been closely coordinated with Tulsa and the host counties.

11. Evacuees from the Oklahoma City Metropolitan area will move from twenty to ninety miles to host counties. The primary means of transportation will be by privately owned vehicles. For those without transportation, city buses and school buses will be used.

12. The entire population of the Risk Area can be moved to host areas in 27 hours. Our plans cover a minimum stay-time of one week. No maximum stay-time is specified.

13. The State Agriculture Department surveyed the food supplies and report adequate packaged foods (on wheels), to sustain the evacuees for more than two weeks. Federally donated Fallout Shelter supplies are warehoused in Oklahoma City and can be easily transported if needed. Practically every town in the host counties has an elevator field with wheat and pastures filled with cattle that can easily be converted to edible food.

Water will be in short supply in some host areas especially under radioactive fallout conditions. The host area Civil Defense Director feel that with strict rationing they can supply adequate water to sustain the evacuees. The State Civil Defense Agency maintains a limited stockpile of pipe and large water pumps that can be used in case of emergency to tap alternate water resources.

There will be a shortage of special medicines and drugs in the host areas. We plan to advise evacuees to take a supply with them when they leave the risk area. After medical supply shortages can be identified shipments will be made from Pharmaceutical Distributors in Oklahoma City to the host areas.

14. The Oklahoma City/County Evacuation Plans breakdown the 27 hour movement period into 9 hour segments. During the first 9 hours citizens are urged to reunite into family groups and will be allowed to leave the city in any direction they wish to travel. Hopefully they will return to the small town where they grew up before moving to Oklahoma City. Evacuees moving to host areas will be registered upon arrival, subsequently information about other family members can be obtained by C.B. and Amateur Radio Nets.

15. The Police and Fire Departments will remain on duty in the Risk Area to protect the property of the evacuees. The plans provide for an evacuation location nearest Oklahoma City for police officers, firemen and critical workers. These personnel will commute to the city on a 12 hour shift basis. When an attack warning is sounded, they will either take cover in underground shelters or retreat outside the risk area.

16. One of the criterion used by the planners in selecting host countries was, do they have a surplus of fallout shelter spaces. Further, the host area plans call for upgrading Cat. 0 and Cat. 1 shelters using slanting techniques and expediant methods.

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17. We are unable to determine the percentage of our population that have designated shelter space in the host counties, since work is still being done in this area.

18. Not applicable.

19. The mayors of all cities have taken an oath to protect the lives and property of the citizens within their city. While the size of the task is contingent upon the nature of the threat, the geographic and socio-economic posture of the city the mayor is still obligated to do everything within his power to protect the citizens.

A. It is obvious that we feel the relocation of population living in high risk areas is both feasible and prudent.

B. We feel the relocation concept is a good first step measure to increase the possibility of surviving a nuclear war. The next goal should be the providing of underground shelter for the entire population of this nation.

C. In the Oklahoma City/County Evacuation Plan we feel we have resolved most of the problems suggested in the most reasonable and practical manner. We realize that problems will arise that are not covered in the plan, however we feel we have developed a framework within our plan through which these problems can be resolved.

20. As mentioned in (B) above, the second step in evacuation planning should be providing underground shelter for the entire population. While we do not feel a nationwide blast shelter program would be acceptable to the congress and the people at this time, we feel a feasible alternative would be a nationwide program of building schools, churches and other public buildings underground. Such a program can be made acceptable by emphasizing the savings in energy and maintenance costs.

CLYDE W. MITCHELL,
Director, Safety & Emergency Services.

DIVISION OF DISASTER EMERGENCY SERVICES,
TEXAS DEPARTMENT OF PUBLIC SAFETY,
Austin, Tex., December 27, 1978.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing, and Urban Affairs, Dirksen Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: In response to correspondence recently released by your office directed to several cities in the State of Texas concerning Nuclear Civil Protection planning, I would like to present a position paper on this subject in behalf of this State regarding the assistance given to and coordination of risk-host governments.

Attached hereto are responses to the questions you developed and presented from the viewpoint of the State of Texas.

I would be remiss in my response if I did not emphasize the importance to risk area residents of the time and effort going into host area planning for the reception, shelter, care, feeding and protection provided within and by host area officials to the displaced population from respective risk areas. Some of the results of this effort can be noted in several tabs to the attached position papers.

Sincerely,

WILSON E. SPEIR,
Director.
MARION P. BOWDEN,
State Coordinator.

Attachment: As shown.

OPENING STATEMENT, STATE OF TEXAS

The State of Texas has been participating in the Crisis Relocation Planning program since 1973. Population relocation is not a new concept in this state due to our proximity to the Gulf of Mexico and the annual threat of hurricanes. It is primarily for this reason that the CRP program has been so successful in Texas. It works. Given a reasonable perception of a large-scale threat to their lives, people have reacted rationally in the past and have evacuated to areas of lower risk. We have no reason to believe that they would not do so in the event

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of a threat of a nuclear attack, if they were properly informed and instructed on where to go and what to do.

Texas state law requires that the chief elected official of a political jurisdiction provide for the protection of life and property of the citizens within that jurisdiction (Texas Disaster Act of 1975 and Executive Order DB 23, May 15. 1978). The Governor is authorized to recommend evacuation of all or part of the population from any stricken or threatened area in the state if he deems this action necessary for the preservation of life, or other disaster mitigation, response, or recovery. Local governments have the same responsibility. Therefore, the authority exists.

The State of Texas firmly believes in the validity and feasibility of Crisis Relocation Planning. Since 1974, population allocations, in accordance with DCPA manual CPG–2–8–B. Guide for Crisis Relocation Planning, Part II, have been completed for 31 of 33 risk areas, the remaining two to be completed this fiscal year. Planning assistance has been provided to risk area governments resulting in the completion of four risk area Crisis Relocation Operations Plans, in accordance with DCPA manual CPG–2–8–D, Guidance for Crisis Relocation Planning, Part IV, and is continuing for the remainder of the risk areas. Additionally, planning assistance has been provided for the completion of 96 of 237 host county plans, in accordance with DCPA manual CPG–2–8–C, Guide for Crisis Relocation Planning, Part III, and is continuing. Local governments have acknowledged the necessity for Crisis Relocation Planning and, in fact. have been enthusiastic about the program.

Barring any decrease in our current staff we expect to complete CR planning by the end of fiscal year 1985.

Question 1. Do you now or have you ever had a population evacuation plan for your cities? If so, for what purpose?

Answer. Evacuation plans have existed in some Texas cities for many years as a result of the threat of hurricanes along the Gulf Coast. Some cities, e.g., Dallas and Austin, had evacuation plans for nuclear attack in the early 1960's.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not describe the differences and how your plan deals with these differences.

Answer. There were no plans in the past developed for both nuclear and natural disaster contingencies.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the tests?

Answer. Population evacuation plans for the hurricane-prone areas have been tested several times, under actual conditions, with great success. Nuclear attack evacuation plans have not been tested. Other natural disaster plans were tested in approximately 18 communities throughout the state each year prior to reduction of funding in 1976 which resulted in cancellation of the program. Each of the natural disaster simulations resulted in a better understanding by local governments of the problems involved in disaster response and recovery.

Question 4. What division or office in your city government is responsible for population evacuation?

Answer. Population evacuation in the State of Texas is the responsibility of the chief elected official in each political jurisdiction. Crisis Relocation for threat of nuclear attack would be initiated only by the Governor at the request of the President.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, State or Federal officials?

Answer. At least once annually.

Question 6. To what extent are Federal, State and local governments included in your program planing

Answer. Federal guidance has been provided by DCPA through a series of planning manuals for crisis relocation contingency planning along with a list of assumptions. Detailed orientation seminars have been conducted by the State Nuclear Civil Protection (NCP) Staff for both the risk and host area planners to familiarize them with the crisis relocation program prior to the initiation of planning in the risk and host areas. A booklet explaining Nuclear Protection Planning and Crisis Relocation Planning is provided planners. (See attached Tabs.) Subsequently, State NCP planners have assisted local planners in writing evacuation plans, host plans and risk area plans. The evacuation plan consists of a camera-ready copy newspaper supplement which explains to the public what to do and

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where to go when notified that evacuation plans are to be implemented. (See attached Tab.) This information is supplemented with sample news releases to keep the public informed as to the state of the crisis situation and action being taken by state and local government to provide for the safety of evacuees. (See attached Tab.) The host area annex to the local EOP provides the information and organization necessary for the reception and care of the evacuees in the host county. (See attached Tab.) The annex is supplemented by the Texas Handbook for Crisis Relocation. (See attached Tab.) The handbook is designed to complement the crisis relocation annex by providing checklists of the major foreseeable actions to be undertaken by each segment of host area government during the several phases of crisis relocation. The host area also has a camera-ready copy of a newspaper supplement and sample news releases to keep the resident population and evacuees informed. (See attached Tabs.) A detailed risk area plan provides for continued functioning of government, essential industry and services following the evacuation. (See attached Tab.) Standing operating procedure in support of the risk area plan are prepared by local department heads.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. Financial resources used to develop population evacuation plans have come from local government, state and federal funds as provided through DCPA.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. Duties and responsibilities of the various city government agencies are those normally accomplished in support of the population: police service, fire/rescue service, health/medical service, reception/care service, and logistics or resource service. The various departments and agencies function under an executive staff. Essential industry would continue to function while non-essential industry would be shut down for the duration of the crisis. Public utilities would continue to provide services within the guidelines established by local, state and federal government.

Question 9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Answer. Most of the risk area cities in Texas have an emergency operating center with emergency fuel and generating capacity and communications facilities. Some are used daily in normal government operations, but some are used only during emergencies.

Question 10. Are evacuation plans coordinated with plans of neighboring metropolitan areas and host areas?

Answer. Crisis relocation plans for all risk areas are coordinated with neighboring metropolitan areas and host areas. Host areas were assigned to each risk area by the State. Evacuation routes have been coordinated and included in risk and host plans.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for evacuees?

Answer. Travel distances for evacuees from the various risk areas in Texas range from 30 to 330 miles. Evacuees from the majority of the Texas risk areas would have to travel less than 100 miles to reach their host destination.

The overwhelming majority of the evacuees will use their personal cars to travel to their host destinations. Those few persons who have no personal transportation available, and who cannot secure rides with neighbors or acquaintances, will be transported to the host areas in buses. Where no city-owned or operated buses are available, or where their capacity is not adequate, city buses will be augmented by school and/or church buses. In some instances, trucks may be assigned to accompany the buses so that baggage can be placed on the trucks and the buses can be used to transport a maximum number of evacuees.

Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. While Crisis Relocation Planning assumes that at least 72 hours will be available for movement to the host areas, most risk areas in Texas could be evacuated in 12 hours or less. The largest risk areas would require substantially longer for the last evacuees to reach their host destinations, but even the largest risk area, Houston, can be evacuated in less than 48 hours.

Current Crisis Relocation planning assumes that evacuees would remain in the host areas for approximately two weeks. The shortest time frame for a plan of this type seems to be approximately one week; because the mechanics of a

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movement of this scale would seem to require at least that long. There are no specifics in current plans which would preclude hosting activities for extended periods; in fact, it is assumed that the evacuees would remain in the host areas indefinitely if an attack were to occur. The planning assumption of two weeks is actually more of an informtional aid for placing Crisis Relocation in perspective. It is not intended as, or does it function as a limiting factor to the efficacy of Crisis Relocation plans.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

Answer. For all areas of resource support, the Texas Emergency Resource Management Plan identifies the state agency or agencies having primary and secondary responsibility for control of that resource. Allocation and distribution of resources at the state and district levels will be under the guidance and control of those agencies as directed in the AERM plan.

At the local level, logistical support of the types in question have been addressed in appropriate appendices to the local Crisis Relocation Annex. Service chiefs have also been appointed by local officials so that each host jurisdiction has an existing cadre with responsibility for provision of these types of support.

FOOD

(1) Distribution: Food distribution will be accomplished in much the same fashion as is the case under normal conditions; i.e., the same wholesalers and transportation agents will be involved and supply and demand will determine distribution of goods. The major differences will arise in the areas of quantity required and means of payment. All host communities with at least one retail food outlet are part of an existing distribution network. Under Crisis Relocation, that same distribution network would serve the community, but the size and frequency of deliveries would be adjusted to reflect the then current demand. Shipments to risk area outlets would be reduced or discontinued, depending on the population of the service area after relocation. Shipments to host areas would be increased in proportion to the population increase experienced by that host area and in proportion to the total supply available for distribution throughout the network. Since the total population under Crisis Relocation conditions would be the same as the population prior to relocation, the major handicaps experienced by the food distribution industry are likely to arise from some loss of efficiency as service routes are modified and as supply lines are lengthened and limited storage capacities are encountered in the smaller communities.

(2) Feeding: In order to guard against any initial shortages in the host communities, and to provide additional fallout shelter supplies in event of an attack, relocatees are instructed to bring some food with them. Actual instructions in the Emergency Public Information (EPI) materials advise risk area residents to maintain a two-week supply of foods which do not require refrigeration and which require little or no preparation. Relocatees are instructed to bring as much of this food with them as they can when they relocate. Each host area plan includes detailed provisions for establishing and operating mass feeding operations in each host community. Potential mass feeding facilities are identified and their food preparation capacities are assessed in Tab 4 to Appendix 5 to the Crisis Relocation Annex. While it is recognized that many current feeding facilities will change drastically or even go out of business before relocation plans might be implemented, this definition of small area requirements will enable local officials to adjust current plans by the addition of new feeding facilities and/or by the improvisation of cooking facilities at appropriate locations.

It is envisioned that relocatees housed in congregate care facilities (mass public housing facilities) will be fed two meals per day at a designated mass feeding facility. Any relocatees staying in private households will dine with that household via an increased allowance of food to the resident household. Subject to some final determination at the Federal level, State and local planning assumes that relocatees will be issued meal tickets and that residents and their guests will be issued some form of ration coupon. Because of the economic disruption which would exist under Relocation, food and other basic goods and services will not be distributed on a cash basis.

WATER

It is not anticipated that water will be a critical item. An initial survey of water supply and/or treatment capabilities is conducted for each host community

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and that information is reported in Tab 7 to Appendix 6 to the Crisis Relocation Annex. In those very few instances where potential shortages have been identified, assignments of relocatees to those communities have been reduced to a level which could be supported if reasonable restraint in nonessential water consumption were observed. Because there could be some delay in establishing distribution systems to some lodging facilities, relocatees are instructed to bring with them at least one gallon of drinking water in unbreakable containers for each member of the family.

MEDICINE

The Texas Department of Health Resources has identified one central control facility in each host county for which a host plan has been prepared. In addition to the medical supplies normally distributed to a county for its resident population, a percentage of the medical supplies originally destined for the appropriate risk area will be sent to that central host county control facility for redistribution within the county. In each instance, the percentage of additional medical supplies allocated to a host county is equal to the percentage of relocatees it is hosting from a particular risk area. To insure that shortages are avoided where possible, and to reduce the requirement for medical supplies in the host areas, the risk area EPI contains instructions for all persons to maintain a 30-day supply of prescription or special medications during periods of international tension and to take those medications with them when they relocate.

SANITARY SUPPLIES

As with water, sanitary supplies are not considered to be an area in which shortages will pose critical problems. Some problems will arise from temporary shortages during initial distribution phases but these can be overcome if relocatees follow printed instructions in the risk area Emergency Public Information releases. Those instructions advise relocatees to bring with them to the risk area certain personal hygiene items which may be in short supply.

A much more critical shortage will exist in waste disposal and treatment facilities. While it would be difficult to make an accurate assessment of surplus capacity which may exist prior to relocation, it seems safe to assume that few host communities could be expected to process three or more times the normal daily volume of effluent. Due to the time required for expanding treatment facilities, which would be far longer than anticipated relocation duration, it is assumed that most host communities will have to improvise some portion of their required disposal facilities.

Question 14. What are the plans for reuniting separated family units?

Answer. It is not anticipated that this will be a significant problem following Crisis Relocation plan implementation. Given the international situation and the resulting public awareness which must exist for Crisis Relocation to be a viable option, very few individuals would be expected to be away from their families at the time relocation plans were implemented. Of those few persons who are away from their families, most will have agreed on a mutual destination in the event relocation occurs. For the remainder, the United States Postal Service bears some responsibility for maintaining records of relocatees' new locations; and the American Red Cross would probably be able to provide some assistance in contacting individuals. Primarily, however, the registration forms which are to be maintained by each host jurisdiction will indicate the members of that household who are present at that address, and the location of the housing facility to which those individuals have been assigned.

Question 15. What provisions are made for protection of property during and after the evacualion?

Answer. The Emergency Public Information releases which have been prepared for high risk areas instruct residents to arrange a safe place for their valuables. This should be accomplished before relocation plans are implemented. That same EPI, in a section entitled "What To Do Now", offers suggestions for reducing the vulnerability of the individual's home and other possessions prior to departure.

Once relocation plans are implemented, local emergency services, including fire and police protection, will be increased to compensate for the increased probability of accidental or criminal occurrences which would pose threats to property in the high risk area.

Question 16. What nuclear radiation fallout protection is provided in the host area?

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Answer. There are three types of structures that can be utilized in the host areas to provide radioactive fallout protection. These facilities are: (a) the National Shelter Survey (NSS) listing; (b) Upgradable shelter facilities; (c) Expedient shelter facilities.

The NSS listing identifies existing fallout shelters in each county. This is the basis from which the "in place" Community Shelter Plan is developed. However, there usually is not enough of this type shelter to satisfy shelter requirements for the combined resident and relocatee populations. Upgradable facilities are fairly substantial buildings that can be upgraded to provide fallout protection by placing dirt overhead and around outside walls. These buildings are identified when the host county is surveyed by Corps of Engineer representatives for host space capacity and are listed in the host county Crisis Relocation plan along with the existing fallout shelters from the NSS listing. The combined capacities of these two types of shelter facilities are usually sufficient to satisfy shelter requirements for the resident and relocated population in any given county. If the total shelter spaces of all buildings listed in "a" and "b" above are not sufficient to satisfy requirements, expedient shelters will need to be constructed. Each host county plan specifies the number of expedient shelter spaces that would be needed, if any, and instructions are contained in the Texas Handbook for Crisis Relocation on how to construct various types of expedient shelter facilities. Each host county plan also contains a listing of all public and privately owned heavy equipment, or earth-moving vehicles, that are located within the county and available to them for upgrading and/or constructing fallout shelters.

Question 17. What percent of the population covered in your plans has designated shelter areas?

Answer. Planning is accomplished to provide Category 2+ radioactive fallout protection for 100 precent (plus a 10 percent to 15 percent growth factor) of the combined resident and relocate population that is allocated to the host county. A combination of all three types of fallout facilities explained in paragraph 16 above may be required in some counties, however, to provide the desired degree of protection. Additionally, in the risk areas, a "relocated mode" community shelter plan is developed to provide best available blast shelters for key workers and the "stay behinds" that are expected to be in the risk area.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: natural disaster, nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Answer. The main focus would be toward a nuclear emergency relocation plan. This type of plan needs to be more detailed and comprehensive than for population caused by natural disasters which are generally more localized and of shorter duration.

Question 19. As mayor of one of the larger cities having to deal with transportation related problems—

(A) Do you think population relocation is feasible in a crisis situation?

(B) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of a nuclear war?

(C) Do you think the problems suggested by the previous questions have a practical solution?

Answer. Yes to A, B, C, in that all communities thus far officially contacted in the State of Texas, have accepted Crisis Relocation as a viable and needed planning concept.

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PUBLIC INFORMATION PACKAGE

FOR

HOST AREA RESIDENTS

AND FOR

PERSONS ARRIVING FROM HIGH RISK AREAS

This material has been prepared for issuance in a host area upon the implementation of a Crisis Relocation Plan. The information contained herein is applicable to both residents of this area and to relocated persons from risk areas. This guidance has been approved by elected leadership in both the host and the risk areas and represents long and arduous planning by both so as to provide their constituents with information, services and facilities to sustain life under anticipated extremely adverse conditions.

The Golden Rule must be invoked: we must do unto others as we would have them do unto us. Cooperation must be wholehearted. discomfort may be the order of the day. We must be prepared to sustain ourselves under difficult conditions. If conditions we may have never experienced before. If we can sustain ourselves under these conditions our chances for SURVIVAL are greatly enhanced. We are facing a situation never visualized by our parents and grandparents, but if we are worthy of our heritage we will overcome our adversities.

The information in this package explains the dangers we face from radioactive fallout and some of the actions we can take to protect ourselves from that threat. It is important that **everyone** read and understand this portion of the information package. Other topics discussed in the package more specifically address factors affecting segments of the combined population. Even though you may be particularly interested in topics of direct concern to you, it is important that you read and understand all of this information. During the days to come, you may feel that you are asked to accept unnecessary hardships or that you are not being treated fairly. Knowing that other persons also are having to make sacrifices is important because years of planning have been devoted to insuring that no one is being treated unfairly and that all restrictions imposed are actually necessary under present conditions.

INFORMATION FOR RESIDENT POPULATION

WHY ARE PEOPLE COMING?

In response to a request from the President, the Governor has directed that people be relocated from those areas in Texas which are considered to be likely targets. By moving most of the people away from high risk areas, many lives can be saved rather than take a chance and suffer direct effects of a nuclear weapon.

IS THERE A PLAN?

The State and every county or city involved has developed comprehensive plans to effectively move people and take care of them until they can return home. It is a big undertaking and will require the support of everyone. All local officials and department heads have participated in the development of the plans.

HOW WILL THEY ARRIVE?

The plan calls for relocating personnel to use their personal automobiles or public transportation and to follow a specified highway to reach us. They will be directed to reception center(s) for assignment to lodging and feeding facilities.

WHERE WILL THEY STAY?

Buildings have already been identified which can accommodate the number of people coming. They will bring their own bedding, some food, and other items essential to their well-being.

WHERE WILL THEY EAT?

Mass feeding facilities have been designated to insure that the relocated population is provided two meals per day. They will be issued meal tickets when they register.

WHERE WILL WE EAT?

You should plan to continue eating at home until otherwise directed. Grocery stores will remain open and you will be issued food stocks as long as supplies are available. When you can no longer prepare your own meals, you will be issued a meal ticket for use at a feeding facility.

WILL ANYONE BE MOVING INTO MY HOUSE?

No one will be assigned to private residences. However if you volunteer to share your home it would certainly make the new arrivals more comfortable and ease the pressure in the lodging facilities. Your food supplies will be augmented if they can also eat in your home. Residents desiring to share their homes with an incoming family should call

HOW LONG WILL THEY BE HERE?

No one knows what the results of the current diplomatic negotiations will be, nor can anyone predict the time involved. Until the crisis is resolved, relocatees will continue to be our guests.

HOW CAN WE HELP?

During the movement period the arriving people will be largely dependent on us for assistance and information. Assistance will be needed at the reception centers, in the lodging and dining facilities, and in other service functions. As people become settled in their lodging facilities they will assume much of the work of supporting themselves, but local volunteers will still be needed to cope with the expanded demand on normal services. You can volunteer your services or any specialized equipment you have. Relocating persons will be bringing only a minimum amount of clothing and bedding. They may need additional items if the stay is extended.

As relocated persons and families arrive, they will be routed along designated traffic routes and through specified checkpoints to registration centers. Traffic, at a minimum, will be heavy and complex. Local residents should avoid adding to this congestion and should make every attempt to avoid these traffic lanes and assembly areas.

HOW WILL WE BE AFFECTED?

The day-to-day lives of local residents will be greatly affected. Many local businesses will be closed in order to conserve resources or because their buildings are needed as lodging facilities for the incoming risk area residents. Churches, schools, and many public recreation facilities will become temporary homes for dislocated persons. Consider these facilities so used as residences and allow their occupants a similar degree of privacy as you have in your home.

Everyone will need to conserve water and power as much as possible because our utilities will be hard pressed to keep up with the increased demand. Do not plan to use the telephone any more than absolutely necessary. It must be reserved for emergency calls only.

WHAT ABOUT FALLOUT SHELTER?

During the first few days after relocation is announced everyone -- residents and relocating persons alike -- will have to work until enough fall-out shelter space has been constructed to provide protection for everyone in the community. All able-bodied persons not assigned to other essential duties will be needed for this task. Do not wait until everyone has arrived from the risk area to begin working on fallout shelter. As soon as the relocation is announced, local residents should begin constructing or improving existing shelter. Relocating persons from the risk area will join in this work as soon as they arrive and will continue working with you until there is enough fallout shelter space for everyone in the community. Local officials will provide guidance concerning which buildings are to be upgraded for fallout shelter and also provide instructions on how the protection in those buildings can be improved. Local officials will also announce what types of tools and heavy equipment are needed to augment items available in the community.

If you have a copy of the Community Fallout Shelter Plan which was developed for the resident population, ignore any instructions contained in that plan which assign residents of certain areas to specific fallout shelter facilities. The information contained in the Community Fallout Shelter Plan concerning radioactive fallout, shelter supplies, and improvising fallout shelter is still correct, but allocation (reservation) of shelter in specific buildings for residents of specific areas within the community no longer applies. All persons will now be sheltered. IF we work together to create the needed shelter space. Regardless of whether you previously had shelter space assigned or were in an area without public shelter. Our goal now is to assure that everyone will have that protection if an attack occurs.

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INFORMATION FOR INCOMING PERSONS

WELCOME TO

During these tense times we recognize that your concern, like ours, is for the safety and as much security as can be possible. In spite of the inconvenience and disruption of our normal lives, we trust that by sharing our community with you and working together, we can survive together and reestablish our normal way of life.

WE KNOW your concerns will be for food and lodging and protection from radioactive fallout should the United States actually be attacked. We will try to meet your needs, however, your stay will not be like home and survival will require everyone working together. This is general information concerning your stay with us. More specific information will be available after you are settled in your lodging.

LODGING — You have been assigned to a building which has space for sleeping. Do not expect hotel accommodations or even beds. The main thing is for you to be protected from the elements. As soon as fallout shelter is constructed for everyone, work will concentrate on improving living conditions.

FOOD — You have also been assigned to a feeding facility in or close to your lodging facility. Meals will be on a scheduled basis and consist of wholesome, nutritious menus based on supplies available. If you have dietary considerations, please notify your lodging facility manager.

WHAT ABOUT SUPPLIES I BROUGHT WITH ME?

The lodging facility manager will advise you whether or not to unpack your car now. If you do bring everything into your lodging facility, try to conserve your supplies. You may need them later if you have to occupy fallout shelter.

MEDICAL — Professional medical assistance is available on a regular schedule. The information board at your lodging facility will carry the schedule. Storage of drugs and medicines brought with you should be arranged with your lodging manager.

RELIGIOUS — Church services will be held in various locations. Announcements will be posted in your lodging facility.

SCHOOLS — For the present time, there will be no public schooling for children. Supervised instruction will be organized as soon as conditions permit.

NEWS — Save your battery powered radios for emergency use. TV and radio receivers in selected areas of your lodging and dining facilities will monitor news broadcasts. Some newspapers may be available. The information board in your lodging facility will also carry pertinent news items.

LAUNDRY — Very limited laundry facilities are available and are subject to available water supplies. Your lodging manager can advise you of the current situation.

YOU WILL BE ASKED to help with the many jobs that have to be done if we are to survive. Special skills you possess may be useful but your willingness and cooperation to perform any task will make your stay more comfortable and assist everyone.

PETS — For those relocatees arriving with pets and being assigned to congregate lodging facilities or public areas, your pet will be impounded and placed within the care of the local veterinarian. Pets will be cared for at a central facility and may be re-claimed at the time of announced return of all relocatees to their homes.

FALLOUT SHELTER must be provided for everyone, residents and relocated persons alike. As soon as you are settled in your lodging facility, you need to join local residents who are already at work constructing or improving fallout shelter space in buildings in this area. Everyone physically able to work will need to assist in this endeavor. Your lodging facility manager can advise you of where your services are needed.

CHECK YOUR INFORMATION BOARD DAILY. It will keep you informed of important events, service schedules and work assignments, as well as major news items.

INFORMATION SHEET FOR OCCUPANTS OF HOST AREA CONGREGATE CARE FACILITY

Organize Your Lodgings

As soon as possible after you are settled in your quarters, it is suggested that you get together with the other occupants and organize your facility. If there is not a building manager already present, the occupants should select one. He will be your contact with local authorities for supplies, information and other items necessary for your comfort and well-being.

Committees should be established to assist the lodging manager in carrying out his responsibilities. The following are suggested to provide for your basic necessities.

1 Food - A food committee will be primarily responsible for establishing feeding schedules and coordinating any special feeding requirements due to health problems (diabetics, babies, etc.). They will also inform you as to where you will be eating as soon as this information is available from local authorities. Everyone except those who have special requirements for reasons of health will be provided two meals a day in order to conserve supplies.

2 Sanitation - This committee will coordinate sanitation requirements, supplies, etc. Due to the crowded conditions, it is essential that high standards of sanitation and personal hygiene be established and maintained. If problems exist, the local Health Department should be notified immediately.

3 Medical - Persons who are trained in first aid should be assigned to this committee. They will be responsible for initial medical treatment in case of accidents, and to provide as much medical self-help as possible to prevent overloading of local medical facilities. They will also notify the local medical officer in the event that additional assistance is required.

4 Fire Safety - Fire is a constant hazard even under the best of conditions. This committee will coordinate with the local fire department for obtaining fire extinguishing devices and establishing a fire prevention program within each lodging facility. It is also recommended that fire watch teams be established for protection during normal sleeping hours.

5 Security - It may be useful to select a few persons to protect the security of your lodging facility and promote good social order in the event that problems should arise. The local law enforcement agencies will understandably be taxed to the limit of their capabilities and may not be able to provide sufficient services to cover all the lodging facilities.

6 Information - This is a vital service of concern to everyone in order to combat rumors and misinformation. A bulletin board for posting notices and schedules would be an asset in each building. A committee to coordinate and receive information from local authorities could perform a very useful function.

7 Training - A committee to coordinate and conduct training sessions is recommended. Subjects most likely to arise in the next few days are first aid, what to do in case of radioactive fallout, organizing and living in a fallout shelter. You may also wish to conduct some type of school for the children.

8 Social Activities - A social committee is suggested to organize and coordinate social activities among and between various lodging facilities. Organized play time for the children and recreation for people of all ages would be beneficial. Day care centers for children of parents who volunteer their services to community projects should also be established.

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HOW TO IMPROVISE

Shelter at Home

This information is primarily intended for persons in rural portions of the county. The information provided here concerning improvising shelter at home should be studied and used if you are too far from the nearest community or if for some other reason you are unable to participate in a community fallout shelter construction program.

If you are in or near a community you could more readily secure protection from radioactive fallout by joining in the community effort to improve the protection provided by existing buildings.

If you are required to take shelter at home, you can add additional protection to that which already exists. Although this might be possible at the time you receive warning to take shelter, a certain amount of preplanning is necessary if satisfactory results are to be expected. NOW IS THE TIME TO DECIDE WHAT YOU WILL DO AND HOW YOU WILL DO IT.

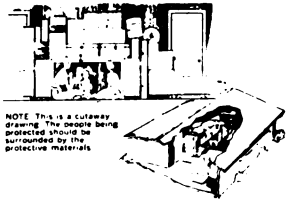
STORM CELLARS



Improvised fallout protection in a storm cellar.

If the existing roof of the storm cellar is made of wood or other light material, it should be covered with one foot of earth for overhead shielding from fallout. More posts or braces may be needed to support the extra weight. After the roof has been shielded, better protection can be provided by blocking the entranceway with concrete blocks, sandbags, bricks, earth or other shielding material, after all occupants are inside the shelter. A few inches should be left open at the top to provide ventilation. If shielding material is not available for the entranceway, shelter occupants should stay as far away from it as possible.

UNDUL FLOOR



Improvised fallout protection in a home without a basement.

Place boxes or drawers on top and around the sides of a sturdy table or workbench and fill them with heavy materials. Often a makeshift table can be made by using doors supported by cabinets or other pieces of furniture.

OUTSIDE HOUSE OR BARN



Improvised fallout protection outside the house.

Dig a shallow ditch (6 inches deep, 6 inches wide) parallel to and about 4 feet from the outside wall. Remove the doors inside the house from their hinges. Place the bottoms of the doors in the shallow ditch (so they will not slip, and lean the doors against the outside wall. On the doors, pile all the shielding materials that they will support. Stack other shielding materials at the ends of the doors. If there is time, make the shelter deeper by digging out more earth inside it. Dig out shallow trenches to allow rain water to drain off away from the shelter. Shielding materials can also be placed on the other side of the wall.

BASEMENTS



Improvised fallout protection in a home with a basement.

Home basements may provide overhead protection against fallout, but the entranceway door may need additional shielding. This could be provided by storing concrete blocks in the cellar. These blocks could be stacked up to form a fourth wall at the entranceway, after your family has entered the cellar.

CROPS

Grain stored in a permanent bin, or ensilage in a covered silo is provided with adequate protection from fallout. A haystack in the open field may be protected with a tarpaulin or similar covering. Many fruits and vegetables will be marketable and none should be destroyed without testing by the use of radiological instruments for radioactivity.

PROTECTION FOR LIVESTOCK

Fallout may be dangerous to cattle, sheep, horses, pigs, and other livestock as well as to human beings. Radioactive materials in fresh fallout can contaminate the immediate environment and give off rays that can penetrate deep into the body. This is the major source of danger for livestock. Animals can also suffer skin burns if fallout settles in the coat.

When it is necessary to graze livestock on fallout contaminated pasture, supplemental feeding from non-contaminated forage can materially reduce the daily dose of radioactive material the animals will eat. Stored or stacked hay, ensilage from either silo or trench, and stored grain would provide safe supplemental feeds. When no shelter is available and when the level of radioactivity is only moderate, or the food resources are scant, growers should, if possible, supply supplemental feeding and limit the grazing time.

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RADIOACTIVE FALLOUT AND FALLOUT SHELTER INFORMATION FOR COUNTY RESIDENTS AND PERSONS RELOCATING FROM HIGH RISK AREAS

The information in this package explains the dangers we face from radioactive fallout and some of the actions we can take to protect ourselves from that threat.

If you are in an isolated area of the county, some of these suggestions might save your life if an attack occurs.

If you join in an effort to provide community protection from radioactive fallout, this material will explain the need for action and suggest some general approaches to meeting the threat. Local officials within the community will announce more specific actions which are best suited to the situation as it exists within your community.

WHAT IS FALLOUT?

If a nuclear weapon explodes on or near the ground, tons of earth are drawn up with the "fireball" produced by the explosion. They mix with the radioactive materials produced by the explosion of the nuclear weapon, and eventually fall back to the ground as particles of "fallout".

- Where these fallout particles come back to the ground depends on the winds.
- Fallout may fall as far as several hundred miles from where the weapon exploded.
- Fallout may arrive within 20 or 30 minutes, close to the place the weapon exploded, it may not arrive for several hours farther downwind.
- The primary danger from fallout particles is caused by the "gamma rays" they give off. Like X-rays, they can harm living things exposed to them.
- Radioactive fallout decays. Seven hours after the burst, fallout is only 1/10th as radioactive as it was at 1 hour after the burst. After 2 days, it is only 1/100th as radioactive as it was at 1 hour.

You can protect yourself from fallout by getting heavy materials (shielding) between yourself and the fallout particles giving off the gamma rays. The heavier the construction of a building you may be in, the better protection it gives off.

Persons exposed to radioactive fallout do not become radioactive. They are neither contagious nor infectious. People who have fallout particles on their bodies or clothing probably would not carry enough to endanger other people, but should brush themselves off for their own protection.

WHAT TO DO IF YOU RECEIVE WARNING TO TAKE SHELTER

ATTACK WARNING will be sounded by local officials in event of attack. You will be advised of the warning signals used by this community. Follow instructions issued at the time attack warning is sounded. It may be necessary to go to fallout shelter immediately upon receipt of attack warning or you may have a limited amount of time for preparation before you need to move to shelter.

REMEMBER!!!

If a very brilliant flash or heavy shock occurs and you are not in a shelter:

(1) If indoors, drop to the floor; get under a bed, desk or heavy table; stay close to the floor, out of the way of flying glass.
(2) If outdoors, quickly get behind a tree, into a ditch or take other protection; cover your head and neck with your arms.
(3) When immediate blast danger is over, follow your family emergency plan to take shelter from radioactive fallout.

FOOD AND WATER

Food

Every family should either build up and keep a 2-week supply of regular food in the home at all times or assemble and maintain a special 2-week stockpile of survival foods in the fallout shelter or home.

Stockpile foods should be in cans, jars, or tightly sealed paper or plastic containers. Select foods that will last for months without refrigeration and can be eaten with little or no cooking. Take into consideration the needs and preference of family members. Familiar foods are likely to be more acceptable in times of stress.

Water

You and your family can get along for quite a while without food, but only for a short time without water. Store a 2 week supply of water for each member of your family NOW.

Under ordinary circumstances, a person consuming an average diet requires a minimum of one-half gallon of water per day for drinking and food preparation, or 7 gallons for a 2 week period. In contrast, half this amount of water is required in a survival diet.

DECONTAMINATION

It is essential that all foods be made edible by decontaminating them. This may be done to many vegetables and fruits harvested shortly after fallout contamination by washing and removing the outer surfaces. After washing, all fruits and vegetables should be examined for radioactivity with radiological instruments before they are eaten. Extra care should be applied to leafy vegetables such as lettuce.

YOUR FAMILY EMERGENCY PLAN

It is important that each family develop its own plans for taking shelter. Not all family plans will be alike, but all should include at least the following:

(1) Be alert to receiving an emergency warning signal. The warning may be from a radio station, a television station, or some local warning device such as a siren or loud-speaker.
(2) Tune your radio to a station which is authorized to continue broadcasting in emergency. A radio station would give you the best information possible.
(3) Take final actions to improve the shelter you have selected to occupy.
(4) Take with you to shelter the provisions you have prepared for the emergency.
(5) Make these advance preparations:
 (a) Decide what each member of the family is to do in case of such an emergency.
 (b) List the survival supplies you will need.
 (c) Keep on hand hard-to-get survival supplies, such as medications, etc.
 (d) Make preparations to carry the supplies to your shelter.
 (e) Arrange for a safe place for your valuables.
 (f) Write here the name or description of where you plan to be sheltered when arrangements are completed.

WHAT TO TAKE TO THE SHELTER

No one can be sure how long it will be necessary to remain in shelter. Although radioactive fallout decays rapidly, under extreme conditions you might have to remain in shelter for a period of up to two weeks. Therefore, plan to take with you as much drinking water and food as you can.

In addition to food and water, take with you a battery operated radio over which you will receive instructions and information. Take with you any special medicines, special foods for babies, diabetics, etc. The amount of clothing and bedding that you take will depend on what you can carry, the condition and location of the shelter and the current and expected weather conditions.

RADIO IN TIME OF EMERGENCY

In time of civil defense emergency, certain specifically designated radio stations will remain on the air to provide emergency information. Locate on your radio dial a broadcast being transmitted from a station located nearby which contains information regarding the emergency situation.

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(MATERIAL WHICH FOLLOWS IS EXCERPTED FROM THE SAN ANTONIO-BEXAR COUNTY CRISIS RELOCATION PLAN. IT IS RISK AREA GUIDANCE.)

AM I IN A TARGET AREA?

The Defense Civil Preparedness Agency believes that most major cities in Texas would be targets in event of a nuclear attack. Whether or not a particular city would be attacked can best be judged by the presence of one or more of the following characteristics:

A. Presence of a military base with an immediate offensive (counterforce) capability
B. Presence of other important military installations
C. A complex of nationally essential businesses and/or industries
D. A large population concentration

Because several of these characteristics are present, there is a very real danger that this area is a possible target.

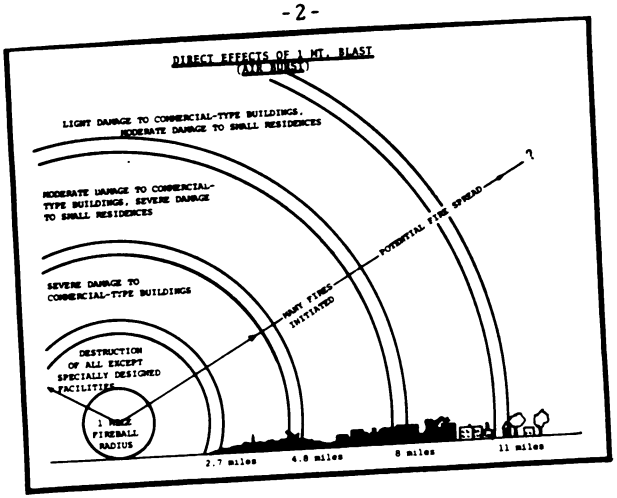
SHOULD I RELOCATE?

Look at the "High-Risk" area map in this supplement. That map displays shaded portions of San Antonio and Bexar County which would probably experience the greatest damage from a nuclear attack. If you live inside the designated area, you could be in considerable danger from the blast and fire effects of nuclear weapons. Your home as well as larger nearby buildings could be destroyed or heavily damaged. You are in the area for which relocation plans have been developed. You should be ready to leave the area if local relocation plans are put into effect.

If your home is outside the designated area, you may be in relatively less danger from the direct effects of a nuclear attack. Your house might suffer light or moderate damage which you and your family could survive if you have taken proper precautions. Larger, more strongly constructed buildings in your neighborhood probably would suffer only light damage. Relocation has not been planned for your area but you should take precautions against fire and radioactive fallout.

If you live very near the boundary of the designated areas, you must make your own decision of whether or not to relocate. See the illustration, "DIRECT EFFECTS OF 1 MT. BLAST," below for the type of damage you might expect in your area. If you decide to remain at home, take all of the same precautions and gather the same supplies suggested for those persons who are planning to relocate. Most stores and businesses will close if relocation occurs and you might be on your own for some time.

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WHERE SHOULD I GO?

The High-Risk area has been divided into sectors. If you live inside one of the sectors, note its number and turn to the correct page which contains instructions for your host destination and highway travel route assignment. Traffic control points along the designated routes will direct you to a reception center within the host area. At the reception center, your family will be assigned to a lodging facility and a feeding facility and will receive additional information on what to expect during your stay in the host area.

HOW DO I GET THERE?

If you have a car, truck, recreational vehicle, or other private transportation, drive it to your designated host county along the route designated in the "RISK-HOST AREA LIST." Traffic will be heavy, and may move slowly over parts of the route. If you get caught in a traffic jam, turn off your engine, remain in your car and listen for official instructions on your car radio. Do not leave your car for any reason. Do not get out of line to find an alternative route. Emergency assistance vehicles and traffic control points will only be available along the designated travel routes. Your patience is requested to accept any delays enroute.

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CAN I GET PUBLIC TRANSPORTATION?

If you have no means of private transportation and can not ride with friends or relatives, public transportation will be provided. Local officials will announce, via newspaper, radio and TV, the time and locations at which public transportation staging areas will be open. If you need public transportation, but are handicapped and unable to go to the staging area, instructions will be broadcast for requesting public transportation from your home. Do not use your telephone to obtain public transportation unless instructed to do so by local officials. If instructed to use your telephone to obtain such assistance, call only the number or numbers specified for that purpose.

WHAT IF I HAVE A PRIVATE DESTINATION?

As the crisis intensifies and relocation seems imminent, if you have a vacation cabin or friends outside the risk area, but within a reasonable distance, go there as soon as possible. As relocation gets under way, it may be difficult or impossible to get to the destination you select.

NOTE: If you do decide to go to a private destination, do not plan to use public lodging facilities; these will be reserved for and filled by persons relocating to their assigned area as instructed by their local government. A mobile home or recreational vehicle would be an excellent means of relocating your family in some degree of comfort for the duration of the crisis. Be sure that any private destination you select is not in another high risk area. Generally, all of the larger cities in Texas - and the areas near those cities - are high risk areas and should be avoided.

As soon as possible after reaching your destination, advise local officials in the nearest community of your presence. Food, fuel, health care, and other resources will be redistributed to host communities to support the relocated populations. Local officials will have to be aware of your presence to accurately determine community needs and insure an equitable distribution of those resources. Fill out and turn in the registration forms in this supplement. They will provide local officials with information necessary to determine local resources needs and will provide assistance in contacting you during the crisis.

REMEMBER: Even in the host area, you will need to have fallout shelter available if an attack should occur. Be certain to pick up an information package explaining the dangers of radioactive fallout and protective actions you can take to guard against those dangers. Also, find out what plans the community has for providing fallout shelter. Unless you already have an existing shelter in your new location, you might obtain better fallout protection by participating in the community shelter effort than by attempting to improvise shelter on your own.

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WHAT TO DO NOW:

There are a number of precautions you should take to improve your capability to cope with Crisis Relocation, or with any other disaster situation that might occur. The check list below provides a guide for things to do now, while there is still time to prepare.

1. Take a First Aid course if one is available.

2. If no First Aid course is available, obtain a good First Aid manual, study it and keep it at home. Be sure that other members of your family are also familiar with basic First Aid procedures.

3. Obtain a good First Aid kit, and keep your home medicine chest well stocked with items you may need in an emergency.

4. Inventory prescription or special medications. Obtain refills if you have less than a 30 day supply of any important medication.

5. Check flashlights and transistor radios. Take flashlights, transistor radios and extra batteries for each when you relocate.

6. Supplement food stocks so that you have a two-week supply of foods which do not require refrigeration and which require little or no preparation.

7. While adequate quantities of water will probably be available in your host area, there could be some delay in establishing distribution systems to all lodging facilities. Take at least one gallon of drinking water in plastic bottles, water cans or other unbreakable containers, for each member of your family.

8. Be sure your car is in good condition for a trip. Keep the gas tank at least half full at all times. (Do not take extra cans of gas along if you are instructed to relocate. Where necessary, additional fuel will be available at rest areas located along your assigned travel route. Any extra gas you take out of the risk area would only reduce supplies available to refuel the trucks bringing food and other survival items to the host area.)

9. Learn where to turn off water, gas, and electricity to your home. (When you relocate, turn off these utilities if instructed by local officials to do so.)

10. If you have fuel oil, butane, or other fuel stored at home, turn off supply lines at the tank before you relocate.

11. Check in and around your home for potential fire hazards. Thermal radiation can start fires in light materials as far as 8 to 10 miles from the point of the explosion. Blast damage to gas or electrical lines can cause fires to start at even greater distances from the actual detonation site.

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12. In addition to normal fire prevention actions, there is one important step which should be taken to reduce your home's vulnerability to fire in a nuclear emergency. Keep the intense heat rays of nuclear explosions from entering the house by closing doors, windows, and venetian blinds. If windows are not fitted with blinds, cover the glass with a light colored water base paint, whitewash, household cleaning powder or even mud. Because thermal radiation travels faster than blast waves, these precautions can shield the inside of your home by reflecting fire-causing heat even though the windows may be broken a short time later when the blast wave arrives.

13. Arrange a safe place for your valuables. Host communities can not assume responsibility for the security of your valuables. If you take such personal possessions with you to the host area you do so at your own risk.

14. Make arrangements for your pets. (If time permits, one solution may be to take your pets now to a friend living outside the risk area who is willing to care for them until you can safely return home.) Do not wait until relocation is announced to provide for your pets. Once relocation is under way, your safety, and the safety of your family will require your full attention.

15. Be sure that you have sufficient quantities of the items you will need to take with you if you relocate. To save time if relocation is announced, plan now how you can pack items to be taken along.

16. Stay tuned to local television or radio stations for instructions. They will broadcast the notice to relocate, if directed by local government officials.

17. Cut out the registration form contained in this supplement and fill in both copies. Take the form with you to the registration center in the host area. (Leave the "HOST AREA HOUSING INFORMATION" section blank. This will be filled in at the registration center when you arrive.

18. Read this supplement carefully and discuss it with your family. If you do not understand any of these directions, call your local Civil Defense office. Take this supplement along if you relocate.

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WHAT TO TAKE WITH YOU:

You should take those things you would take for a vacation trip of a week or more - plus some other items you will need for your stay in the host area, including tools needed to help construct fallout shelter and those things you will need to take into the shelter if an attack occurs. Do not take all your favorite belongings; your home and property will be protected while you are away. All items on this list should be included if you have your own transportation. If you use public transportation, take as many as you can carry. Items marked with asterisks (*) represent the minimum list of items which should be taken as needed for each member of your family.

CLOTHING & BEDDING

- * work gloves
- * work clothing and shoes
- * casual clothing (seasonal)
- * extra underclothing and socks or stockings
- * pajamas and housecoats
- * rain garments
- * sewing kit
- * sheets and blankets
- * pillows
- cots or sleeping bags
- plastic drop cloth

TOOLS FOR SHELTER CONSTRUCTION

(take along the ones you have)

- shovel
- pick ax
- ax
- crowbar
- hammer and nails
- screw drivers and screws
- hand saw
- power saw and extension cord
- heavy duty staple gun and staples

* INFANT CARE SUPPLIES (IF NEEDED)

Bring all items you have that would be necessary for care of your baby. Be sure to include any special formula or medications.

FOOD & UTENSILS

- Take all the food you can carry (canned or dried food requiring little or no preparation)
- water (at least one gallon per person in plastic bottles or water cans)
- * special or dietary foods
- bottle and can opener
- eating utensils
- plastic or paper plates, cups, paper towels and napkins
- plastic and paper bags

PERSONAL HYGIENE

- * toothbrush and toothpaste
- * comb and shaving articles
- * toilet paper
- * sanitary napkins
- * towels and washcloths
- * bath soap and laundry detergent

SAFETY & MEDICAL

- * battery operated radio and extra batteries
- * flashlight and extra batteries
- * candles and matches
- * first aid kit
- * prescription or special medications

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WHEN SHOULD I GO?

The decision to implement the Crisis Relocation plan can not be a local determination. Because of the tremendous effect relocation would have on the economy, and on the lives of all citizens, that decision must be made by the President of the United States and his advisors following consultation with the governors of the various states. If you do not have a private destination, wait until you receive official notification through local government that relocation has been advised for this area. If you have some place to go and your job or family commitments do not require that you remain, it might be advisable that you take your family out of the risk area now, before organized relocation makes traveling to the destination of your choice difficult or impossible.

HOW MUCH TIME WILL I HAVE?

If relocation is announced, you should have several days to prepare and to get to your host area. The basic factor which makes planned relocation possible is the fact that the Soviet Union would need at least 72 hours (three days) to complete movement of their population once their relocation is begun. Once Soviet movement is detected, all high risk areas in Texas will be able to begin and complete their relocation before Soviet relocation is completed. If you are prepared to move, there is no need to wait until the last minute; but there is also no reason to rush out of the risk area in the first few hours. Take the time necessary to check your supplies, lock your house and protect your property before you go. Review the section in this supplement ("WHAT TO DO NOW") to see that you have made all necessary preparations before you go.

WHAT ABOUT MY JOB?

Most businesses will close when relocation is announced, and will remain closed until the crisis has been resolved and an attack no longer seems probable. The survival of the United States population is far more important than any possible loss of profit resulting from such closure. Some vital activities will be continued during the crisis. Police, fire and other emergency services, and all industries whose products are essential for defense or for the immediate well-being of the population, will continue to function on a somewhat revised schedule. Persons required for this type of essential activity will relocate with their families to their assigned host areas and will commute to the risk area in shifts. If your services are required, your employer will notify you and you will receive more detailed instructions in the next few days.

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WILL I NEED TO TAKE MONEY?

Do not take large amounts of cash with you when you relocate. You may wish to take a small cash reserve along to cover unanticipated situations; but all basic necessities will be provided regardless of ability to pay. NOTE: It may take several days to deliver adequate quantities of some necessary items to the host areas. For that reason, and because few items other than basic necessities will be available, a list of "WHAT TO TAKE WITH YOU" is included in this supplement. The list contains some items which are so necessary that you should not risk being without them even for a few days; as well as some other items which are readily available at home and so easily taken along that there is no reason to leave them at home and be uncomfortable if replacements can not be obtained in the host area.

WHAT WILL I DO IN THE HOST AREA?

When you arrive at the reception center, you will be asked to register and list any skills or training which may be of value during the crisis. After getting settled in a lodging facility and caring for immediate needs, the first priority for everyone will be to construct or improve sufficient fallout shelter for all persons in the community. This probably will mean one or two days of fairly hard work, but will be absolutely necessary to insure your safety if an attack should occur. Once the task of providing sufficient fallout shelter has been accomplished, you will probably be asked to assist host personnel in meeting the existing needs of the combined population. The degree of comfort and security with which any community meets the crisis period will depend almost entirely on the talent and responsiveness with which individuals face the situation.

WHEN CAN I COME HOME?

While in the host community, you will be kept informed both by local officials and by the public media of events back home as well as on the international scene. As soon as the crisis has been resolved and you can safely come back home, you will be given instructions covering the return phase. You may be instructed to remain in the host area longer than seems to you to be necessary. If so, it will be for an excellent reason. Everyone can not rush back home at the same time. A number of persons will have to return sooner than others because sanitation services, health and medical services, grocery stores and other necessary operations must be restored before it would be possible for the remainder of the population to safely return to the area. No one can say today how long you may have to remain in the host area, but officials will make every effort to keep your absence from home as short as is safely possible.

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YOUR COMMUNITY SHELTER PLAN

WHERE TO GO AND WHAT TO DO
IN CASE OF NUCLEAR ATTACK

REMEMBER: Crisis Relocation is a plan based on the most probable chain of events; that any attack would be preceded by movement of enemy populations out of their high risk areas. While this would be the most probable action, the possibility still exists that an attack could come at any time. Whether or not crisis relocation has been announced, IF you are inside the high risk area and receive information that the United States is under attack, or that an attack is probable, follow the Community Fallout Shelter plan for taking shelter as soon as possible.

If a very brilliant flash or heavy shock occurs and you are not in a shelter: (1) IF INDOORS, drop to the floor; get under a bed, desk, or heavy table, and stay close to the floor, out of the way of flying glass. (2) IF OUTDOORS, quickly get into a ditch, behind a tree, or other protection. Cover your head and neck with your arms. (3) Then follow the instructions in your Community Fallout Shelter plan.

If you have a copy of the Community Fallout Shelter Plan, study it along with this Crisis Relocation Plan so that you will be prepared for either contingency. If you do not have a copy of that plan, and have heard no official announcement concerning its distribution, call the local civil defense office for information.

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(MATERIAL WHICH FOLLOWS IS EXCERPTED FROM THE WILLIAMSON COUNTY PUBLIC INFORMATION PACKAGE FOR HOST AREA RESIDENTS AND PERSONS ARRIVING FROM HIGH RISK AREAS.)

NOTICE TO RESIDENTS AND RELOCATEES

This material has been prepared for issuance in a host area upon the implementation of a Crisis Relocation Plan. The information contained herein is applicable to both residents of this area and to relocated persons from risk areas. This guidance has been approved by elected leadership in both the host and the risk areas and represents long and arduous planning by both so as to provide their constituents with information, services and facilities to sustain life under anticipated extremely adverse conditions.

The "Golden Rule" must be invoked; we must "do unto others as we would have them do unto us." Cooperation must be wholehearted; discomfort may be the order of the day. We must be prepared to sustain ourselves under difficult conditions - conditions we may have never experienced before. If we can sustain ourselves under these conditions, our chances for SURVIVAL are greatly enhanced. We are facing a situation never visualized by our parents and grandparents, but if we are worthy of our heritage we will overcome our adversities.

The information in this package explains the dangers we face from radioactive fallout and some of the actions we can take to protect ourselves from that threat. It is important that **everyone** read and understand this portion of the information package. Other topics discussed in the package more specifically address factors affecting segments of the combined population. Even though you may be particularly interested in topics of direct concern to you, it is important that you read and understand all of this information. During the days to come, you may feel that you are asked to accept unnecessary hardships or that you are not being treated fairly. Knowing that other persons also are having to make sacrifices is important because years of planning have been devoted to insuring that no one is being treated unfairly and that all restrictions imposed are actually necessary under present conditions.

INFORMATION FOR RESIDENT POPULATION

WHY ARE PEOPLE COMING?

In response to a request from the President, the Governor has directed that people be relocated from those areas in Texas which are considered to be likely targets. By moving most of the people away from high risk areas, many lives can be saved rather than take a chance and suffer direct effects of a nuclear weapon.

IS THERE A PLAN?

The State and every county or city involved has developed comprehensive plans to effectively move people and take care of them until they can return home. It is a big undertaking and will require the support of everyone. All local officials and department heads have participated in the development of the plans.

HOW WILL THEY ARRIVE?

The plan calls for relocating personnel to use their personal automobiles or public transportation and to follow a specified highway to reach us. They will be directed to reception center(s) for assignment to lodging and feeding facilities.

WHERE WILL THEY STAY?

Buildings have already been identified which can accommodate the number of people coming. They will bring their own bedding, some food, and other items essential to their well-being.

WHERE WILL THEY EAT?

Mass feeding facilities have been designated to insure that the relocated population is provided two meals per day. They will be issued meal tickets when they register.

WHERE WILL WE EAT?

You should plan to continue eating at home until otherwise directed. Grocery stores will remain open and you will be issued food stocks as long as supplies are available. When you can no longer prepare your own meals, you will be issued a meal ticket for use at a feeding facility.

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HOW LONG WILL THEY BE HERE?

No one knows what the results of the current diplomatic negotiations will be, nor can anyone predict the time involved. Until the crisis is resolved, relocatees will continue to be our guests.

WILL ANYONE BE MOVING INTO MY HOUSE?

No one will be assigned to private residences. However, if you volunteer to share your home it would certainly make the new arrivals more comfortable and ease the pressure in the lodging facilities. Your food supplies will be augmented if they can also eat in your home. Residents desiring to share their homes with an incoming family should call

HOW WILL WE BE AFFECTED?

The day-to-day lives of local residents will be greatly affected. Many local businesses will be closed in order to conserve resources or because their buildings are needed as lodging facilities for the incoming risk area residents. Churches, schools, and many public recreation facilities will become temporary homes for dislocated persons. Consider these facilities so used as residences and allow their occupants a similar degree of privacy as you have in your home.

Everyone will need to conserve water and power as much as possible because our utilities will be hard pressed to keep up with the increased demand. Do not plan to use the telephone any more than absolutely necessary; it must be reserved for emergency calls only.

HOW CAN WE HELP?

During the movement period, the arriving people will be largely dependent on us for assistance and information. Assistance will be needed at the reception centers, in the lodging and dining facilities, and in other service functions. As people become settled in their lodging facilities, they will assume much of the work of supporting themselves, but local volunteers will still be needed to cope with the expanded demand on normal services. You can volunteer your services or any specialized equipment you have. Relocating persons will be bringing only a minimum amount of clothing and bedding. They may need additional items if the stay is extended.

As relocated persons and families arrive, they will be routed along designated traffic routes and through specified checkpoints to registration centers. Traffic, at a minimum, will be heavy and complex. Local residents should avoid adding to this congestion and should make every attempt to avoid these traffic lanes and assembly areas.

WHAT ABOUT FALLOUT SHELTER?

During the first few days after relocation is announced, everyone - residents and relocating persons alike - will have to work until enough fall-out shelter space has been constructed to provide protection for everyone in the community. All able-bodied persons not assigned to other essential duties will be needed for this task. Do not wait until everyone has arrived from the risk area to begin working on fallout shelter. As soon as the relocation is announced, local residents should begin constructing or improving existing shelter. Relocating persons from the risk area will join in this work as soon as they arrive and will continue working with you until there is enough fallout shelter space for everyone in the community. Local officials will provide guidance concerning which buildings are to be upgraded for fallout shelter and also provide instructions on how the protection in those buildings can be improved. Local officials will also announce what types of tools and heavy equipment are needed to augment items available in the community.

If you have a copy of the Community Fallout Shelter Plan which was developed for the resident population, ignore any instructions contained in that plan which assign residents of certain areas to specific fallout shelter facilities. The information contained in the Community Fallout Shelter Plan concerning radioactive fallout, shelter supplies, and improvising fallout shelter is still correct, but allocation (reservation) of shelter in specific buildings for residents of specific areas within the community no longer applies. All persons will now be sheltered IF we work together to create the needed shelter space. Regardless of whether you previously had shelter space assigned or were in an area without public shelter, our goal now is to assure that everyone will have that protection if an attack occurs.

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INFORMATION FOR INCOMING PERSONS

WELCOME TO Williamson County. During these tense times we recognize that your concern, like ours, is for the safety and as much security as can be possible. In spite of the inconvenience and disruption of our normal lives, we trust that by sharing our community with you and working together, we can survive together and reestablish our normal way of life.

WE KNOW your concerns will be for food and lodging and protection from radioactive fallout should the United States actually be attacked. We will try to meet your needs; however, your stay will not be like home and survival will require everyone working together. This is general information concerning your stay with us. More specific information will be available after you are settled in your lodging.

LODGING — You have been assigned to a building which has space for sleeping. Do not expect hotel accommodations or even beds. The main thing is for you to be protected from the elements. As soon as fallout shelter is constructed for everyone, work will concentrate on improving living conditions.

FOOD — You have also been assigned to a feeding facility in or close to your lodging facility. Meals will be on a scheduled basis and consist of wholesome, nutritious menus based on supplies available. If you have dietary considerations, please notify your lodging facility manager.

WHAT ABOUT SUPPLIES I BROUGHT WITH ME?

The lodging facility manager will advise you whether or not to unpack your car now. If you do bring everything into your lodging facility, try to conserve your supplies. You may need them later if you have to occupy fallout shelter.

MEDICAL — Professional medical assistance is available on a regular schedule. The information board at your lodging facility will carry the schedule. Storage of drugs and medicines brought with you should be arranged with your lodging manager.

RELIGIOUS — Church services will be held in various locations. Announcements will be posted in your lodging facility.

SCHOOLS — For the present time, there will be no public schooling for children. Supervised instruction will be organized as soon as conditions permit.

NEWS — Save your battery powered radios for emergency use. TV and radio receivers in selected areas of your lodging and dining facilities will monitor news broadcasts. Some newspapers may be available. The information board in your lodging facility will also carry pertinent news items.

LAUNDRY — Very limited laundry facilities are available and are subject to available water supplies. Your lodging manager can advise you of the current situation.

YOU WILL BE ASKED to help with the many jobs that have to be done if we are to survive. Special skills you possess may be useful but your willingness and cooperation to perform any task will make your stay more comfortable and assist everyone.

PETS — For those relocatees arriving with pets, and being assigned to congregate lodging facilities or public areas, your pet will be impounded and placed within the care of the local veterinarian. Pets will be cared for at a central facility and may be re-claimed at the time of announced return of all relocatees to their homes.

FALLOUT SHELTER must be provided for everyone, residents and relocated persons alike. As soon as you are settled in your lodging facility, you need to join local residents who are already at work constructing or improving fallout shelter space in buildings in this area. Everyone physically able to work will need to assist in this endeavor. Your lodging facility manager can advise you of where your services are needed.

CHECK YOUR INFORMATION BOARD DAILY. It will keep you informed of important events, service schedules and work assignments, as well as major news items.

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INFORMATION SHEET FOR OCCUPANTS OF HOST AREA CONGREGATE CARE FACILITY

Organize Your Lodgings

As soon as possible after you are settled in your quarters, it is suggested that you get together with the other occupants and organize your facilty. If there is not a building manager already present, the occupants should select one. He will be your contact with local authorities for supplies, information and other items necessary for your comfort and well-being.

Committees should be established to assist the lodging manager in carrying out his responsibilities. The following are suggested to provide for your basic necessities:

1. Food - A food committee will be primarily responsible for establishing feeding schedules and coordinating any special feeding requirements due to health problems (diabetics, babies, etc.). They will also inform you as to where you will be eating as soon as this information is available from local authorities. Everyone except those who have special requirements for reasons of health will be provided two meals a day in order to conserve supplies.

2. Sanitation - This committee will coordinate sanitation requirements, supplies, etc. Due to the crowded conditions, it is essential that high standards of sanitation and personal hygiene be established and maintained. If problems exist, the local Health Department should be notified immediately.

3. Medical - Persons who are trained in first aid should be assigned to this committee. They will be responsible for initial medical treatment in case of accidents, and to provide as much medical self-help as possible to prevent overloading of local medical facilities. They will also notify the local medical officer in the event that additional assistance is required.

4. Fire Safety - Fire is a constant hazard even under the best of conditions. This committee will coordinate with the local fire department for obtaining fire extinguishing devices and establishing a fire prevention program within each lodging facilty. It is also recommended that fire watch teams be established for protection during normal sleeping hours.

5. Security - It may be useful to select a few persons to protect the security of your lodging facility and promote good social order in the event that problems should arise. The local law enforcement agencies will understandably be taxed to the limit of their capabilities and may not be able to provide sufficient services to cover all the lodging facilities.

6. Information - This is a vital service of concern to everyone in order to combat rumors and misinformation. A bulletin board for posting notices and schedules would be an asset in each building. A committee to coordinate and receive information from local authorities could perform a very useful function.

7. Training - A committee to coordinate and conduct training sessions is recommended. Subjects most likely to arise in the next few days are first aid, what to do in case of radioactive fallout, organizing and living in a fallout shelter. You may also wish to conduct some type of school for the children.

8. Social Activities - A social committee is suggested to organize and coordinate social activities among and between various lodging facilities. Organized play time for the children and recreation for people of all ages would be beneficial. Day care centers for children of parents who volunteer their services to community projects should also be established.

RADIOACTIVE FALLOUT AND FALLOUT SHELTER INFORMATION FOR COUNTY RESIDENTS AND PERSONS RELOCATING FROM HIGH RISK AREAS

The information in this package explains the dangers we face from radioactive fallout and some of the actions we can take to protect ourselves from that threat.

If you are in an isolated area of the county, some of these suggestions might save your life if an attack occurs.

If you join in an effort to provide community protection from radioactive fallout, this material will explain the need for action and suggest some general approaches to meeting the threat. Local officials within the community will announce more specific actions which are best suited to the situation as it exists within your community.

FACTS ABOUT A NUCLEAR EXPLOSION

If you are in an unprotected area near where a nuclear weapon explodes, you could not survive the effects of the blast and heat generated by the explosion. After the explosion, the major danger is from radiation sickness caused by radioactive fallout. This fallout can endanger the life and health of people outside the high risk area. However, protective measures can be taken to safeguard you and your family from the effects of nuclear fallout.

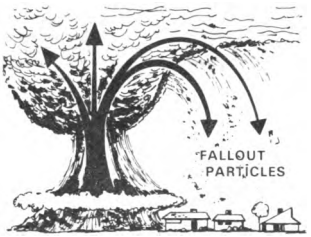
This section describes what fallout is and how to protect yourself against its effects.

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WHAT CAUSES FALLOUT...

When a nuclear weapon explodes, great quantities of earth and other debris are sucked up into a nuclear cloud. The bits and particles of earth are mixed with the radioactive materials produced by the explosion and become "radioactive."

Within a short time, these fallout particles drift back to earth. Carried by the wind, they can spread over a large area far from the explosion site.



The particles may look like fine grains of sand, but the gamma rays they give off cannot be seen. (Special instruments are required to detect the rays and measure their intensity.) The particles can be swept, brushed, or washed off.

- Where these fallout particles come back to the ground depends on the winds.
- Fallout may fall as far as several hundred miles from where the weapon exploded.
- Fallout may arrive within 20 or 30 minutes, close to the place the weapon exploded, it may not arrive for several hours, farther downwind.

WHY FALLOUT IS DANGEROUS...

- The primary danger from fallout particles is caused by the "gamma rays" they give off. Like X-rays, they can harm living things exposed to them.

The gamma rays given off by radioactive fallout particles can cause physical and chemical changes in the cells of the body, causing radiation sickness. No special clothing can protect you from the rays and there is no known drug or chemical that can prevent radiation from damaging the cells of the body. Large doses of radiation will cause death. But if you receive small or medium doses, the body will repair itself and you will get well.

The amount of gamma radiation that you can tolerate depends on a number of factors. The effects of radiation are more severe in very young or very old persons and those not in good health. Also, a single large dose received in a short period of time is more damaging than the same dose received over a longer period. People exposed to radiation DO NOT BECOME RADIOACTIVE and consequently are not dangerous to other people. Radiation sickness is NOT contagious and one person cannot infect another.

HOW TO PROTECT AGAINST FALLOUT

Radiation loses its strength:

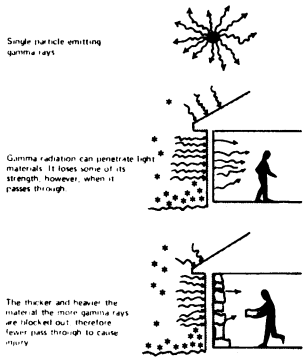
- With the passage of time
- As it passes through materials
- As the distance from the particle is increased

The best protection is to surround yourself with heavy materials. A fallout shelter will give you this kind of protection.

A fallout shelter does not need to be a special type of building. Any building will provide some level of protection. If the walls and roof are thick or heavy enough to absorb many of the rays given off by the particles outside, then better protection can be obtained. Even caves and mines can provide protection.

The key fact to remember is the farther you are from radioactive fallout particles, the safer you are from radiation. For example, you have more protection in a basement than on the top floor of a building. Likewise, there is more protection in an inner corridor of an above-grade structure than near an outside wall.

The gamma rays can pass through light materials. A considerable thickness of heavy material is required to stop the penetration of these rays.



The important points to remember about the danger of fallout are:

- You cannot see the gamma rays given off by fallout particles.
- Gamma radiation can penetrate light materials, therefore, heavy clothing alone will not protect you from these rays. If fallout particles should get on your skin, they should be brushed off to avoid skin burns.
- Radiation is more dangerous to very young, very old or sick people than to those in good health.
- A large dose of radiation received in a short period is more damaging than smaller doses received over a longer period.
- Radiation sickness is not contagious and cannot be passed from one person to another.

WHO WILL NEED FALLOUT PROTECTION

There is no way of predicting in advance where or how soon fallout will settle to the ground. This depends on the weather and on the direction and speed of the winds.

Areas close to a nuclear explosion might receive fallout within 20 or 30 minutes. Depending on the winds, it may take 5 to 10 hours for particles to drift down on communities 100 miles or more from the explosion.

The heavier particles giving off the most intense radiation will fall first. The lighter particles falling later will have lost much of the radiation high in the atmosphere. The first 24 hours after the fallout begins to settle are the most dangerous. The radiation from the particles loses its strength over time. The longer you are in a shelter, the lower the outside radiation levels will be when you emerge.



After a nuclear attack, dangerous levels of fallout COULD occur any place in the United States. Everyone, therefore, must have protection in case fallout occurs in his community.

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MORE ABOUT FALLOUT.

PRECAUTIONS

If caught in the open during fallout, for your own protection and the protection of others, remove all of the dust from clothes and hair by washing and brushing. This should be done as soon as possible after entering the shelter.

If traveling in an automobile during a fallout, keep all windows closed. Be sure, however, that there is sufficient ventilation. Avoid getting fallout particles into your nostrils or mouth.

SYMPTOMS OF RADIATION EXPOSURE
Symptoms of three degrees of radiation sickness are:

MILD — The especially sensitive person will show some nausea, lack of appetite and fatigue within a few hours after exposure. He should rest but can continue normal activites. Recovery will be rapid.

MODERATE—The same symptoms appear as above well within two hours of exposure, and most markedly. Vomiting and even prostration may occur. By the third day, recovery may seem complete, but symptoms may recur in the next days or weeks.

SEVERE — Again, all the early symptoms show up and may vanish after a few days. But after a week or more, fever, mouth soreness and diarrhea may appear; gums and mouth may ulcerate and bleed. In about the third week, the patient's hair may start to fall out. Recovery may take seven to eight weeks. When exposure has been overwhelming, death comes in hours or weeks.

TREATMENT OF RADIATION EXPOSURE
Treat symptoms in this way:

General rest; aspirin for headache; motion-sickness tablets for nausea; liquids as soon as possible for diarrhea and vomiting, but not until vomiting has stopped (ideally; one teaspoon of table salt to one quart of cool water, to be sipped slowly). This solution can be used for a mouthwash for sore mouth also. Radiation sickness is not contagious or infectious.

SPECIAL MEDICINES for radiation exposure

Although experiments have been conducted, there is little likelihood that a pill or any other type medicine will be developed that can protect people from the effects of fallout radiation.

FOODS AND FALLOUT

All foods that have been well packaged or canned may be consumed safely if their cover is washed clean before opening. Even green vegetables from the garden are safe if they are washed clean. The main safety precaution is to avoid swallowing any of the fallout material. Exposure to gamma rays alone will NOT contaminate your food.

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HOW TO IMPROVISE

Shelter at Home

This information is primarily intended for persons in rural portions of the county. The information provided here concerning improvising shelter at home should be studied and used if you are too far from the nearest community; or if, for some other reason, you are unable to participate in a community fallout shelter construction program.

If you are in or near a community, you could more readily secure protection from radioactive fallout by joining in the community effort to improve the protection provided by existing buildings.

If you are required to take shelter at home, you can add additional protection to that which already exists. Although this might be possible at the time you receive warning to take shelter, a certain amount of preplanning is necessary if satisfactory results are to be expected. NOW IS THE TIME TO DECIDE WHAT YOU WILL DO AND HOW YOU WILL DO IT.

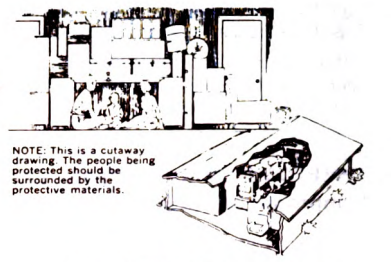
STORM CELLARS



Improvised fallout protection in a storm cellar.

If the existing roof of the storm cellar is made of wood or other light material, it should be covered with one foot of earth for overhead shielding from fallout. More posts or braces may be needed to support the extra weight. After the roof has been shielded, better protection can be provided by blocking the entranceway with concrete blocks, sandbags, bricks, earth or other shielding material, after all occupants are inside the shelter. A few inches should be left open at the top to provide ventilation. If shielding material is not available for the entranceway, shelter occupants should stay as far away from it as possible.

GROUND FLOOR



Improvised fallout protection in a home without a basement.

Place boxes or drawers on top and around the sides of a sturdy table or workbench and fill them with heavy materials. Often a makeshift table can be made by using doors supported by cabinets or other pieces of furniture.

OUTSIDE HOUSE OR BARN



Improvised fallout protection outside the house.

Dig a shallow ditch (6 inches deep, 6 inches wide) parallel to and about 4 feet from the outside wall. Remove the doors inside the house from their hinges. Place the bottoms of the doors in the shallow ditch (so they will not slip, and lean the doors against the outside wall. On the doors, pile all the shielding materials that they will support. Stack other shielding materials at the ends of the doors. If there is time, make the shelter deeper by digging out more earth inside it. Dig out shallow trenches to allow rain water to drain off away from the shelter. Shielding materials can also be placed on the other side of the wall.

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BASEMENTS



Improvised fallout protection in a home with a basement.

Home basements may provide overhead protection against fallout, but the entranceway door may need additional shielding. This could be provided by storing concrete blocks in the cellar. These blocks could be stacked up to form a fourth wall at the entranceway, after your family has entered the cellar.

CROPS

Grain stored in a permanent bin, or ensilage in a covered silo is provided with adequate protection from fallout. A haystack in the open field may be protected with a tarpaulin or similar covering. Many fruits and vegetables will be marketable and none should be destroyed without testing by the use of radiological instruments for radioactivity.

PROTECTION FOR LIVESTOCK

Fallout may be dangerous to cattle, sheep, horses, pigs, and other livestock as well as to human beings. Radioactive materials in fresh fallout can contaminate the immediate environment and give off rays that can penetrate deep into the body. This is the major source of danger for livestock. Animals can also suffer skin burns if fallout settles in the coat.

When it is necessary to graze livestock on fallout-contaminated pasture, supplemental feeding from non-contaminated forage can materially reduce the daily dose of radioactive material the animals will eat. Stored or stacked hay, ensilage from either silo or trench, and stored grain would provide safe supplemental feeds. When no shelter is available and when the level of radioactivity is only moderate, or the food resources are scant, growers should, if possible, supply supplemental feeding and limit the grazing time.

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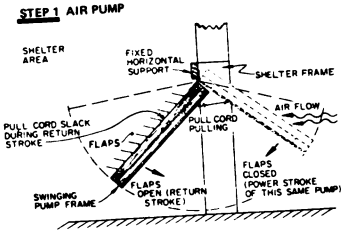
If you are improvising shelter at home, you will need to make some provision for lighting and ventilation in the shelter. Using the instructions on this page, and working with such materials as you may have you can construct manually powered fans which will provide an adequate flow of air in the shelter, and emergency lights which will make the shelter environment more comfortable. *

* If you are going to a community fallout shelter, you will be instructed within the next few days if either the air pump or the emergency lights are needed in your shelter. Do not plan to bring either of these items with you unless you are asked to do so by the shelter manager.

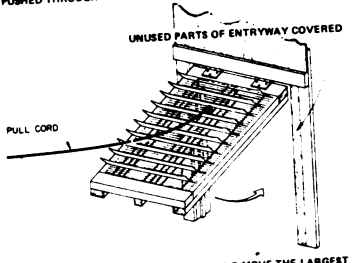
AIR VENTILATION PUMP

STUDY ALL INSTRUCTIONS BEFORE STARTING CONSTRUCTION

STEP 1 AIR PUMP



THE AIR PUMP OPERATES BY BEING SWUNG LIKE A PENDULUM. IT IS HINGED AT THE TOP OF ITS SWINGING FRAME. IT IS SWUNG BY PULLING AN ATTACHED CORD. THE FLAPS ARE FREE TO ALSO SWING AND WHEN THEY ARE IN THE CLOSED POSITION, AIR IS PUSHED THROUGH THE OPENING THAT THE PUMP IS ATTACHED TO.



TO OBTAIN MAXIMUM EFFICIENCY AND MOVE THE LARGEST AMOUNT OF AIR, THE UNUSED PORTIONS OF THE ENTRYWAY SHOULD BE COVERED WITH WOOD, PLASTIC, CLOTH, STIFF PAPER OR SIMILAR MATERIALS.

STEP 2 MATERIALS AND TOOLS NEEDED TO CONSTRUCT AN AIR PUMP

(MATERIALS SIZED FOR A 36-INCH BY 29-INCH PUMP) LUMBER SIZES CAN BE ALTERED, DEPENDING ON AVAILABILITY.

*A. LUMBER

SIZE	QUANTITY	SIZE	QUANTITY
1" X 2" X 36"	2	1" X 2" X 32"	2
1" X 1" X 36"	1	1" X 1" X 32"	1
1" X 2" X 29"	2	1" X 4" X 36"	1

B. ONE PAIR ORDINARY DOOR OR CABINET BUTT HINGES, OR METAL STRAP HINGES, OR IMPROVISED HINGES MADE OF LEATHER, WOVEN STRAPS, CORDS OR FOUR HOOK & EYE SCREWS WHICH CAN BE JOINED TO FORM TWO HINGES.

C. 24 NAILS ABOUT 2" LONG, PLUS SCREWS FOR HINGES.

*D. POLYETHYLENE FILM, 3 TO 4 MILS THICK, OR PLASTIC DROP-CLOTH, OR RAINCOAT-TYPE FABRIC, OR STRONG HEAVY PAPER – 10 RECTANGULAR-SHAPED PIECES, 30" X 5½".

*E. 30' OF SMOOTH, STRAIGHT WIRE FOR USE AS FLAP PIVOT WIRES – (ABOUT AS THICK AS COAT-HANGER WIRE) OR CUT FROM 10 WIRE COAT HANGERS, OR 35' OF NYLON STRING (COAT-HANGER WIRE THICKNESS).

*F. 30 SMALL STAPLES, OR SMALL NAILS, OR 60 TACKS TO ATTACH FLAP PIVOT WIRES TO WOOD FRAME.

*G. 30' OF ¾" TO 1" WIDE PRESSURE-SENSITIVE WATERPROOF TAPE THAT DOES NOT STRETCH, OR USE NEEDLE AND THREAD TO SEW HEM TUNNELS TO THE FLAPS.

*H. FOR FLAP STOPS, 150 FT OF LIGHT STRING, STRONG THREAD, OR THIN SMOOTH WIRE. 90 TACKS OR SMALL NAILS TO ATTACH FLAP STOPS TO THE WOOD FRAME, OR FLAP STOPS CAN BE TIED TO THE FRAME.

I. 10 FEET OF CORD FOR THE PULL CORD.

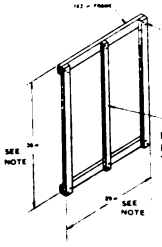
J. DESIRABLE TOOLS: HAMMER, SAW, WIRECUTTER-PLIERS, SCREWDRIVER, SMALL DRILL, SCISSORS, KNIFE, YARDSTICK, AND PENCIL.

* Items must be sized or adjusted to fit opening into which airpump is to be placed.

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STEP 3 HOW TO CONSTRUCT THE AIR PUMP

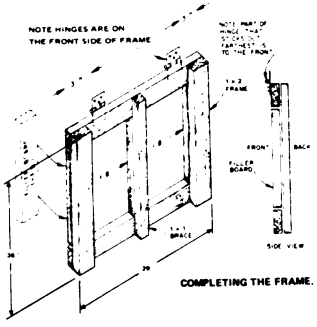
A. CUT LUMBER AND ASSEMBLE FRAME AS SHOWN



NOTE: DIMENSIONS SHOWN FOR FRAME MAY HAVE TO BE ADJUSTED TO FIT OPENINGS IN A SHELTER.

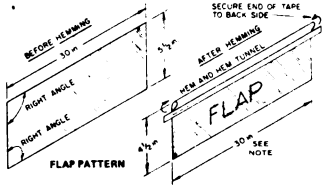
BACK SIDE OF FRAME

B. COMPLETE FRAME AND ATTACH HINGES. IF DRILL IS NOT AVAILABLE TO DRILL SCREW HOLES TO ATTACH HINGES, USE A NAIL TO MAKE THE HOLES.



COMPLETING THE FRAME.

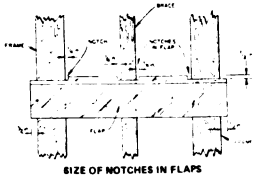
C. CUT 10 RECTANGULAR STRIPS 30" LONG BY 5¼" WIDE FOR USE AS FLAPS. HEM FLAPS AS SHOWN. USE PRESSURE-SENSITIVE TAPE OR SEW HEM SHUT TO FORM HEM TUNNEL.



FLAP PATTERN

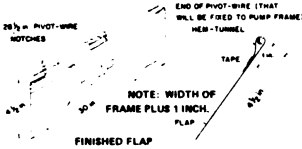
NOTE: WIDTH OF FRAME PLUS 1 INCH

AFTER HEM IS MADE, CUT NOTCHES IN FLAPS AS SHOWN. AVOID CUTTING TAPE THAT HOLDS HEM.



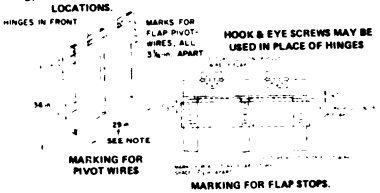
SIZE OF NOTCHES IN FLAPS

INSERT 10 PIECES OF STRAIGHT WIRE (PIVOT WIRES) INTO FLAP HEM AS SHOWN. FLAPS SHOULD SWING FREELY. STRING CAN BE USED IF WIRE NOT AVAILABLE (WIRE COAT-HANGER THICKNESS).



FINISHED FLAP

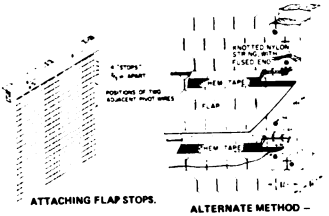
D. MARK PUMP FRAME FOR PIVOT WIRE AND FLAP STOP LOCATIONS.



MARKING FOR FLAP STOPS.

NOTE: FRAME DIMENSIONS MAY HAVE TO BE ADJUSTED TO FIT OPENING IN SHELTER

E. ATTACH FLAP STOPS (STRINGS OR WIRES) TO THE PUMP FRAME AT THE MARKED LOCATIONS. 4 FLAP STOPS ARE NEEDED BETWEEN ADJACENT PIVOT WIRES.

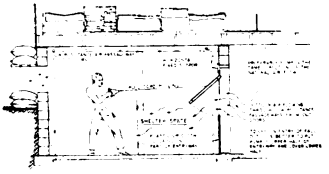


ATTACHING FLAP STOPS.

ALTERNATE METHOD – WIREMESH AS FLAP STOPS.

F. STARTING FROM THE BOTTOM – STAPLE, NAIL, TACK OR TIE THE FLAP PIVOT-WIRES WITH FLAPS IN THEIR MARKED POSITIONS. ATTACH HINGES TO HORIZONTAL SUPPORT BOARD. ATTACH PULLCORD TO CENTER BRACE.

STEP 4. TYPICAL INSTALLATION OF AIR PUMP

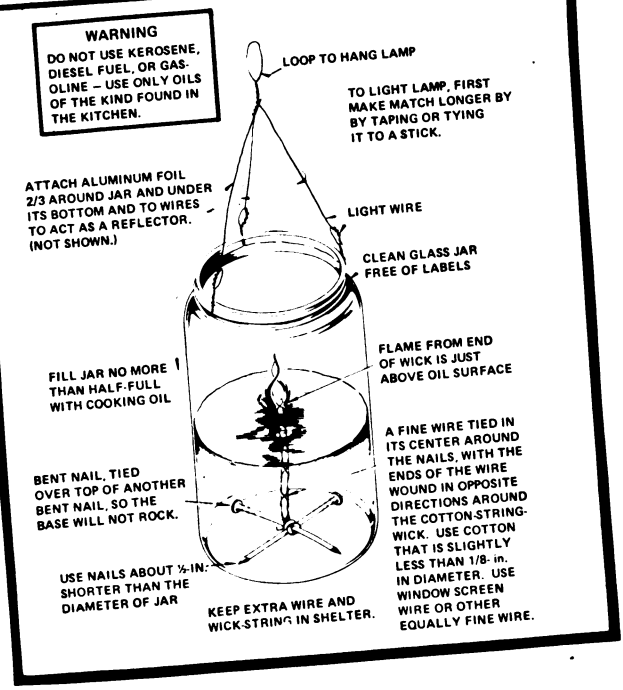


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A nuclear attack would probably disrupt electrical service even in areas not damaged by direct weapons effects. Using readily available materials and following the instructions shown here, you can construct an emergency lamp which will provide a low level of lighting in the shelter area.

A lamp of this type will use about 3 ounces of cooking oil in 24 hours. By using lighting of this type, you can save flashlight batteries for those times when brighter or more portable lighting is required.

EMERGENCY LAMP



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WHAT TO TAKE TO A PUBLIC SHELTER

There is no way to predict how long you may have to remain in the shelter.

Under extreme conditions, you may have to stay there for as long as two weeks.

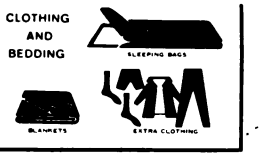
EATING UTENSILS AND FOOD



Food and Water. Choose food that needs no refrigeration and does not have to be cooked. Canteens or plastic jugs of water.

Special Foods for diabetics, etc.
Infant Food and Supplies.
Medicines.

CLOTHING AND BEDDING



Flashlight and Batteries.
Transistor Radio and Batteries.
Books, Games and other entertainment.

WHAT NOT TO TAKE TO SHELTER

Pets.
Large or Bulky Items.

Heat or Flame Producing Devices (except matches and lighters).

Firearms.
Food Requiring Cooking or Refrigeration.

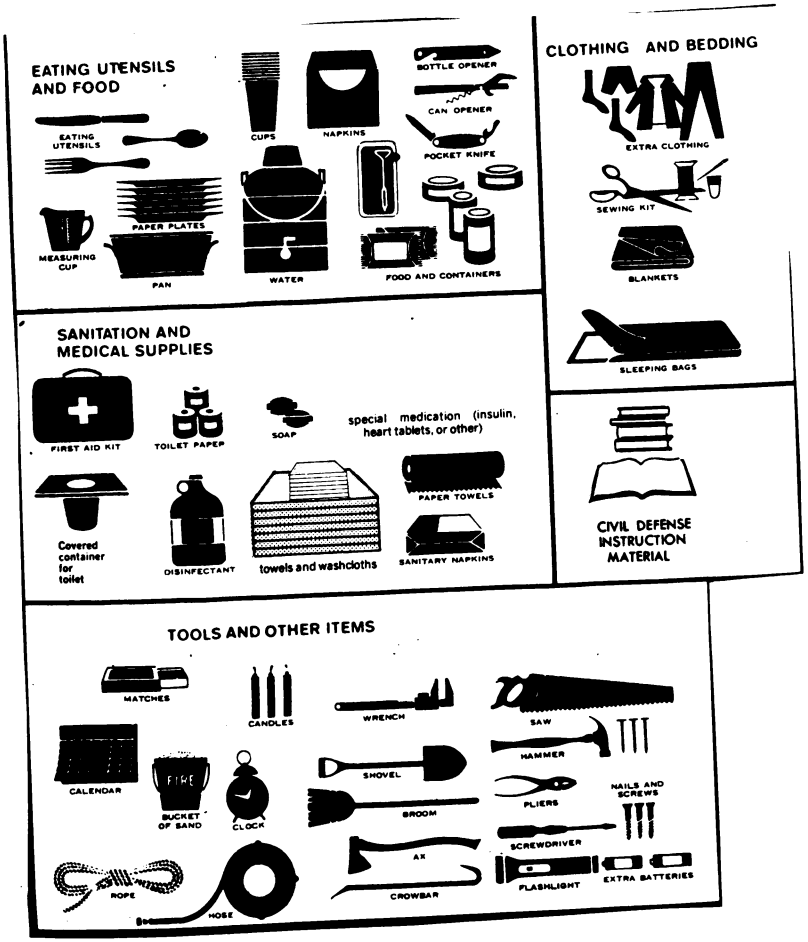
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HOME SHELTER SUPPLIES

-13-

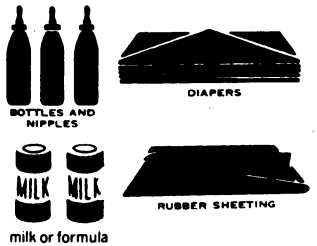
If you take shelter in the best protected part of your home, you will need supplies. The most vital things would include food, water, a can opener, a container for human waste, toilet paper, soap, a first aid kit, a battery-powered radio, a flashlight, infant needs, bottles, nipples, milk etc., and needs for invalids, special medicines, etc. . . . Other supplies may include bedding, extra clothing, towels, paper plates, knives, forks, spoons, cups, napkins, newspapers, sanitary napkins, paper or plastic bags, diapers, candles, and tools.

You might have to stay in your home shelter area for only 1 or 2 days, but it is possible that you might have to stay there for as long as 2 weeks. Therefore, take as many supplies as possible to your shelter area.

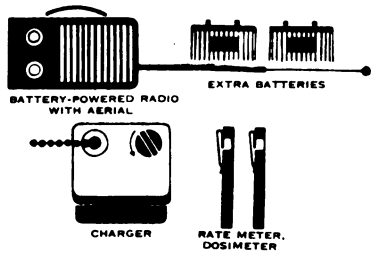


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INFANT-CARE SUPPLIES



RADIATION METERS. RADIO



FOR PROPER SEWAGE AND GARBAGE DISPOSAL YOU WILL NEED...



Two large containers with tight lids for garbage



One large container with tight lid for emergency storage of human wastes



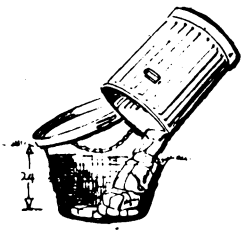
Waterproof plastic bags



Insecticides and deodorants

Shovel (as soon as possible, body wastes and garbage should be buried under 12 to 24 inches of earth.)





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EL PASO CITY-COUNCIL CIVIL DEFENSE,
El Paso, Tex., January 2, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing and Urban Affairs,
Washington, D.C.

DEAR SIR: We have been informed that your committee on Banking, Housing and Urban Affairs is conducting Hearings on Civil Defense and more specifically that facet of Civil Defense known as Crisis Relocation Planning (CRP). Although El Paso is not one of the twenty major cities in the Nation and was therefore not a recipient of the Committee's CRP questionnaire, we do have an interest in CRP and would like to contribute to the Committee's hearings.

At this time El Paso does not have a CRP, but we are developing such a plan in conjunction with the Texas Division of Disaster Emergency Services. Therefore, in reply to the Committee's questionnaire, our comments are mostly in the future tense and reflect consideration of factors applicable to our City.

Question 1. Do you now or have you ever had a population evacuation plan for your city? If so for what purpose?

Answer. No, El Paso has never had such a plan.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. El Paso's CRP will be for nuclear alert situations. If the CRP were to be used in a natural disaster, it would be equally applicable.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. No plan; no test; and no results.

Question 4. What division or office in your city government is responsible for population evacuation?

Answer. The El Paso City-County Civil Defense office is responsible for population evacuation.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, State or Federal officials?

Answer. No CRP. The City-County Emergency Operations Plan is reviewed biennially by City-County officials; triennially by State officials; and as required by Federal officials.

Question 6. To what extent are Federal, State and local governments included in your program planning?

Answer. State and local governments will be included to the maximum in our program planning. Federal government will be included as requested by the state government.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. At this time, only state financial resources have been utilized.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. Each agency of City government will be assigned duties and responsibilities pertinent to its department. Public utilities and private industries will also be included to assist in those areas when they are capable of assisting.

Question 9. Do you have an emergency operating center? What capabilities does it have? Is it in daily use?

Answer. No.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. Yes, it will be.

Question 11. What distances will the evacuees have to travel to host areas? For what types of transportation are planned/provided for evacuees?

Answer. The maximum distance to be travelled by any group of evacuees will be approximately 300 miles. The minimum distance is approximately 100 miles. Transportation will depend primarily on privately owned vehicles of all types. Commercial buses and school district buses will be used to the utmost.

Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. Computerized study predicts 72 hours. Evacuees will remain in host area up to 30 days if necessary. Longer with additional special planning.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

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Answer. Coordination and diversion of logistical support to host areas rest with state authority, local authorities will assist in the execution of the state plan.

Question 14. What are the plans for reuniting separate family units?

Answer. Family registration points will be established in each host county. A Displaced Persons (DP) clearing center will be established to assist in reuniting families.

Question 15. What provisions are made for protection of property during and after the evacuation?

Answer. Vital services of the City Police, Fire, Medical, water, sanitation, etc., will designate key personnel and supervisors to remain behind to operate and protect the City. Billets and other facilities have already been identified immediately outside the computerized risk area of the City for the stay-behind personnel.

Question 16. What nuclear radiation fallout protection is provided in the host area?

Answer. Limited to existing structures which are comparatively few.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. The total population will receive shelter from the elements. Only approximately 40–60 percent would have adequate protection from radiation fallout.

Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: Natural disaster; nuclear emergency or dual purpose (both natural disaster and nuclear emergency)?

Answer. Primarily nuclear emergency.

Question 19. As mayor of one of the larger cities having dealt with transportation related problems, (A) Do you think population relocation is feasible in a crisis situation? (B) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of nuclear war? (C) Do you think the problems suggested by the previous questions have a practical solution?

Answer. A. Yes; B. yes, and C. yes.

Question 20. The committee would welcome any additional comments or information on population evacuation plans not covered by the above questions.

Answer. A substantial increase in Civil Preparedness funding and 80–20 (Federal-local) matching funds would facilitate planning and action to save American lives.

The City of El Paso has increased greatly both in land mass and population since Fallout Shelters were certified and stocked in the mid-1960's. The Army Corps of Engineers has not certified any new shelters since that time due to lack of funds. The food and medical supplies originally stocked in the shelters have long ago been declared unfit for human consumption and have been discarded. Shelters were not restocked due to lack of funding.

The cost of recertifying and restocking fallout shelters would appear to be prohibitive compared to Crisis Relocation Planning. Then too, fallout shelters are not necessarily blast shelters. CRP offers the potential of protecting a greater part of the population against both blast and fallout.

If further information concerning CRP is required by the Committee, we will do our utmost to comply.

Sincerely,

JACK PARKS.

OFFICE OF THE MAYOR,
Fort Worth, Tex., December 29, 1978.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs, Washington, D.C.

DEAR SENATOR PROXMIRE: Although Fort Worth was not a primary addressee in the distribution of the questionnaire on evacuation plans, we feel that since we have a plan in being which provides for crisis relocation affecting approximately 850,000 residents of Forth Worth and Tarrant County, our answers to the questionnaire would be of some value to your committee's hearing on civil defense.

I am convinced that our Civil Defense Office has devised a viable, workable plan that immeasurably increases the survival ability of our population in the event of a crisis involving impending nuclear exchange. Since the Forth Worth area would undoubtedly be a priority target due to the retaliatory strike capa-

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bility of the Strategic Air Command unit at Carswell Air Force Base plus the defense industries in the area, we feel that whatever action we can take to plan for the survival of a large percentage of our populace is most certainly worthwhile and justifies the comparatively modest expenditure of funds involved in creating and supporting a plan such as we now have.

Answers to the questionnaire distributed by your office are attached. If we can be of any further service to the committee in this matter, please let us hear from you.

Sincerely,

HUGH PARMER,
Mayor.

Enclosures (2) Questionnaire with answers Media articles.

ANSWERS TO THE QUESTIONNAIRE DISTRIBUTED BY THE OFFICE OF SENATOR PROXMIRE

Question 1. Do you now or have you ever had a population evacuation plan for your City? If so, for what purpose?

Answer. Fort Worth currently has a Crisis Relocation Plan which offers the opportunity for relocation to all persons residing in Fort Worth and Tarrant County who desire to avail themselves of the increased chance for survival in the event of an impending or threatened nuclear attack upon the military targets in this area. This plan will not be used to cover hurricane or flood evacuation since this area is not subject to these contingencies.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. The Crisis Relocation Plan is designed only for dealing with relocation in the event of a crisis involving probable nuclear attack. The City has a separate Emergency Action Plan which is designed specifically for dealing with natural or man-made disasters such as storms, floods, riots, catastrophic fires or explosions.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. The crisis relocation has not been tested by an actual evacuation drill. The practice movement of several hundred thousand persons that a test would involve would be too expensive and disruptive to be feasible. Since the plan itself is based on the natural human desire to flee from impending disaster, it is felt that cooperation of a majority of the populace is assured. Education of the public is already in progress through newspaper and television coverage of the plan and a high degree of public interest and acceptance of the plan has been noted thus far. It is feasible to test the plan through computer analysis and testing and a project to accomplish this task has been proposed and will soon be offered to contractors for bids, according to our latest information.

Question 4. What division or office in your city government is responsible for population evacuation?

Answer. The Fort Worth-Tarrant County Office of Civil Defense, headed by the Civil Defense Coordinator and under the direct supervision of the City Manager, who functions as the Civil Defense Director, is responsible for the Crisis Relocation Plan as well as the City's Emergency Action Plan.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials?

Answer. Appropriate City officials are in possession of copies of emergency plans and are kept abreast of revisions and changes as they occur. A periodic exercise of the City's Emergency Plan is carried out at which time all appropriate City agencies participate in dealing with a simulated disaster. During the exercise, actual communications are transmitted with directions for appropriate actions by police, fire, public works, utilities companies, hospitals, public transportation, and other agencies. Actual response and action is carried out where feasible. State and federal civil defense officials were present to observe the last exercise of this type which was conducted November 18, 1977. At this time a review of crisis relocation planning was accomplished by these officials. State civil defense representatives maintain close liaison with our Civil Defense Office on a day-to-day basis and are kept abreast of any developments, revisions, or changes concerning the current plans. Our next emergency plan exercise is scheduled for February 16, 1979.

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Question 6. To what extent are federal, state and local governments included in your program planning?

Answer. We receive valuable training assistance and guidance from the federal Region 5 Defense Civil Preparedness Agency at Denton, Texas. Our key Civil Defense staff personnel attend courses of instruction at Region 5 as well as courses furnished by the Staff College at Battle Creek, Michigan, which provides both home study and resident courses in civil defense planning and operations. Assistance from the Division of Disaster Emergency Services in Austin (State level civil defense) is frequently used to coordinate our actions with host cities and counties. They also keep us informed on civil defense activities of other Texas municipalities. Our Civil Defense Office has also been augmented by assignment of twenty Air Force Reserve Officers from the 9006th Air Reserve Squadron, whose headquarters is at Denver, Colorado. Our Civil Defense Office operates an active training program for these officers, offering a training class consisting of four hours per month of disaster preparedness training and assisting them in arranging for their attendance at the Denton and Battle Creek civil defense courses. These officers have been used during their annual two week active duty tours to accomplish research and complete various projects connected with our Crisis Relocation and Emergency Plans.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. The expense connected with creating the Crisis Relocation Plan was shared by the City of Fort Worth and Tarrant County with the federal government providing matching funds to support eligible projects or expenditures, as well as the administrative expenses and salaries supporting the Fort Worth-Tarrant County Office of Civil Defense. It is felt that the cost of this activity is relatively small considering the benefits derived or expected to accrue from this effort.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. The following agencies have been assigned duties and responsibilities as indicated:

a. City manager.—Assigned the position of Director, Civil Defense. Is responsible for evaluating information and recommendations furnished by the Civil Defense Coordinator and making decisions as to action to be taken by the various agencies involved in dealing with any emergency. Is responsible for directing civil defense actions and furnishing policy guidelines for civil defense staff operations and activities. Directs the coordinated activities of all agencies involved when the Emergency Operations Center is activated by his order to deal with disaster or emergencies.

b. City police department.—This agency is assigned duties in any emergency consistent with its normal functions of law enforcement, traffic control, and protection of life and property. The Chief of Police or his designated representatives will be present in the Emergency Operations Center when it is activated and will direct the actions of the police units involved through the communications facilities provided in the EOC for their use. Police personnel will remain in the risk area during crisis relocation activities to provide law enforcement and protection of lives and property.

c. City fire department.—The Fire Department is assigned duties consistent with its normal functions of rescue and fire fighting activity. The Fire Chief or his designated representatives will be present in the EOC when it is activated so as to direct and coordinate the activities of the various units through the communications facilities provided for their exclusive use in the EOC. Like the police, they will remain in the risk area during crisis relocation periods to assist in protecting lives and property during the absence of the bulk of the populace.

d. Public works department.—Is assigned the tasks in a disaster situation of clearing debris to facilitate movement of emergency traffic, furnishing and erecting barricades where required, placing warning signs and signals to indicate hazards, detours, or restrictions to travel or movement. Furnish equipment and technical skills in support of rescue efforts or hazard removal when requested or directed to do so. Furnish a knowledgeable and responsible official to direct Public Works activities from the EOC during activation and use of that facility.

e. Public utilities.—Are assigned the tasks of neutralizing hazards following a disaster by deactivating electrical circuits where necessary, shutting off gas or water to broken mains or residential systems. Water Department will isolate un-

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needed mains so as to direct maximum pressure and flow to areas where fire fighting activities are in progress. Effect emergency repair of damaged facilities where there is a need for immediate restoration of service due to emergency requirements. Furnish a knowledgeable and responsible individual for duty in the EOC to direct and coordinate the activities of utility crews using communication facilities provided.

f. County sheriff's department.—Assigned the duties consistent with the normal functions of the department of law enforcement, traffic control, and protection of life and property. The Sheriff or his designated deputy will be present in the EOC when that facility is activated to coordinate and direct the activities of departmental units using communications provided.

g. County fire marshal.—Will carry out duties consistent with his normal function of directing and coordinating the activities of County fire units. The Fire Marshal or his designated assistant will be present in the EOC during activation and operation of that facility to coordinate and direct the activities of County fire units.

h. City and county tax offices.—Assigned the duty of assessing property damage and assisting in identifying and locating owners of real property affected by any disaster. Will be available for call if needed to assist EOC operations by gathering or furnishing information for the EOC Director (City Manager).

i. City and county treasurers' offices.—Assigned the duties of making necessary emergency funds available to support actions arising from a disaster or emergency situation. Responsible for safeguarding funds in the event of relocation or evacuation of office personnel.

j. City transportation agency (CITRAN).—This agency is responsible for providing auxiliary transport for evacuees not able to use personal vehicles. Citran will also have a representative in the EOC to coordinate and direct the use of buses for relocation and to furnish transportation for movement of people from disaster areas to treatment facilities or assembly points.

Question 9. Do you have an emergency operating center? Is it in daily use?

Answer. Yes. Our EOC is fully equipped with facilities, situation maps, communications, emergency power source, and emergency communications backup capability. It is located underground between the City Hall and the Police station (Public Safety Building). It will accommodate all necessary personnel from all agencies involved and furnishes each agency with phone communications and radio transceivers operable on the assigned frequencies of the agency concerned. This facility is partially used as an office by the Civil Defense Plans Section during periods of normal operation and this section also has the responsibility for maintaining all EOC maps and facilities in a current and operationally ready condition. The EOC can and will be used for directing and coordinating activities required to deal with natural or man-made disasters as well as activities during crisis relocation and preparation for nuclear attack.

Question 10. Is your plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. Yes. Coordination has been effected to ensure that no conflict exists between the plans of Forth Worth-Tarrant County and Dallas County. Mutual support is available from both areas if needed although no formal agreement has yet been finalized. All host counties have been surveyed by the U.S. Corps of Engineers to assess their support capabilities and the numbers of relocatees assigned to each host area is consistent with surveyed capability. Each host county has been furnished the written annex to our relocation plan that outlines the requirements and responsibilities to be fulfilled or assumed by the host area. Acceptance of our plan and cooperation offered by host county officials has been outstanding.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for the evacuees?

Answer. Relocatees will be allocated or assigned to 26 separate counties which are mostly west and northwest of the City of Forth Worth. The farthest distance to be traveled is 280 miles. The nearest host area requires 29 miles of travel. Evacuees will use family cars for transport where available. Public buses will be used to transport those not using their own vehicles. Refueling capability will be provided for those required to travel the longer distances and for those deficient of fuel at the outset. The possibility of using rail transport in the event of a fuel shortage is being explored and appears to be a feasible alternative.

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Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. We estimate that the last evacuee should depart the risk area within 35 hours of the implementation of the plan. Arrival at the farthest host destination by the last evacuee should occur within 43 hours. These estimates are based on calculations made by traffic engineers and allow for enough extra time to take care of unforeseen problems and delays that could reasonably occur. The plan is designed to support evacuees for a two-week period in the host area. We feel that extraordinary measures can be taken to extend that period if the situation should require such action.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

Answer. Evacuees are being educated by the media and will be instructed to carry all possible supplies with them such as food, bedding, tools, water, sanitary items, etc. Shipments of foodstuffs and other necessities into the risk area will be diverted to host areas to provide ample supplies of these items to the evacuees. Host area plans call for activation of all possible food preparation facilities such as church and school kitchens to augment area restaurant capability to feed the evacuees when their personal food supplies have been exhausted. Host area Red Cross and hospital facilities will be mobilized and augmented by qualified evacuees to provide emergency assistance and medical treatment in sufficient amounts to take care of the assigned number of evacuees. State and federal civil defense offices have resources plans which call for reassignment or relocation of doctors and medical personnel to host areas or disaster areas plus plans for reallocation and diversion of food shipments. These plans are supported by State laws which give the governor authority to direct such actions as are necessary to carry out present plans.

Question 14. What are the plans for reuniting separate family units?

Answer. Our relocation plan does not call for separation of family units except for those families of key personnel who remain in the risk area. These families will all be relocated to the nearest host area and key workers will commute to the risk area as long as this is possible or feasible. Key personnel will be on a two-shift around-the-clock schedule. Instructions will be given evacuees as to actions to be taken to handle inadvertent separation of family members, i.e., identification tags for children, etc.

Question 15. What provisions are made for protection of property during and after evacuation?

Answer. Police and Fire Department personnel are designated as key personnel who will continue to operate in the risk area until forced to cease by actual attack. They will perform their normal functions of law enforcement and protection of life and property. With a two-shift operation and cancellation of vacations and normal days off, more patrol action will be possible to prevent looting or other unlawful activities in the evacuated area. Evacuees will be instructed to secure domiciles and store property prior to relocation wherever possible or feasible.

Question 16. What nuclear radiation fallout protection is provided in the host area?

Answer. Normal expedient shelter facilities such as suitable public buildings, schools, churches, and private facilities such as factories, warehouses, etc., which qualify as shelters will be available to evacuees in the host area. Written instructions for preparation of expedient shelter capability have been furnished host area officials.

Question 17. 100 percent of the population covered by our plan will have sheltered living space designated for them in the host area to which they are assigned. The majority of this space is either qualified as a fallout shelter or can be upgraded to such status.

Question 18. This question is not applicable to Fort Worth-Tarrant.

Answer. County.

Question 19. As mayor of one of the larger cities having dealt with transportation related problems.

a. Do you think population relocation is feasible in a crisis situation?

b. Do you see relocation as a practical solution to increasing the possibility of population survival in the event of nuclear war?

c. Do you think the problems suggested by the previous questions have a practical solution?

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bility of the Strategic Air Command unit at Carswell Air Force Base plus the defense industries in the area, we feel that whatever action we can take to plan for the survival of a large percentage of our populace is most certainly worthwhile and justifies the comparatively modest expenditure of funds involved in creating and supporting a plan such as we now have.

Answers to the questionnaire distributed by your office are attached. If we can be of any further service to the committee in this matter, please let us hear from you.

Sincerely,

HUGH PARMER,
Mayor.

Enclosures (2) Questionnaire with answers Media articles.

ANSWERS TO THE QUESTIONNAIRE DISTRIBUTED BY THE OFFICE OF SENATOR PROXMIRE

Question 1. Do you now or have you ever had a population evacuation plan for your City? If so, for what purpose?

Answer. Fort Worth currently has a Crisis Relocation Plan which offers the opportunity for relocation to all persons residing in Fort Worth and Tarrant County who desire to avail themselves of the increased chance for survival in the event of an impending or threatened nuclear attack upon the military targets in this area. This plan will not be used to cover hurricane or flood evacuation since this area is not subject to these contingencies.

Question 2. Is your plan equally applicable to natural disasters and nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. The Crisis Relocation Plan is designed only for dealing with relocation in the event of a crisis involving probable nuclear attack. The City has a separate Emergency Action Plan which is designed specifically for dealing with natural or man-made disasters such as storms, floods, riots, catastrophic fires or explosions.

Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. The crisis relocation has not been tested by an actual evacuation drill. The practice movement of several hundred thousand persons that a test would involve would be too expensive and disruptive to be feasible. Since the plan itself is based on the natural human desire to flee from impending disaster, it is felt that cooperation of a majority of the populace is assured. Education of the public is already in progress through newspaper and television coverage of the plan and a high degree of public interest and acceptance of the plan has been noted thus far. It is feasible to test the plan through computer analysis and testing and a project to accomplish this task has been proposed and will soon be offered to contractors for bids, according to our latest information.

Question 4. What division or office in your city government is responsible for population evacuation?

Answer. The Fort Worth-Tarrant County Office of Civil Defense, headed by the Civil Defense Coordinator and under the direct supervision of the City Manager, who functions as the Civil Defense Director, is responsible for the Crisis Relocation Plan as well as the City's Emergency Action Plan.

Question 5. How often are your population evacuation plans and operations reviewed by city officials, state or federal officials?

Answer. Appropriate City officials are in possession of copies of emergency plans and are kept abreast of revisions and changes as they occur. A periodic exercise of the City's Emergency Plan is carried out at which time all appropriate City agencies participate in dealing with a simulated disaster. During the exercise, actual communications are transmitted with directions for appropriate actions by police, fire, public works, utilities companies, hospitals, public transportation, and other agencies. Actual response and action is carried out where feasible. State and federal civil defense officials were present to observe the last exercise of this type which was conducted November 18, 1977. At this time a review of crisis relocation planning was accomplished by these officials. State civil defense representatives maintain close liaison with our Civil Defense Office on a day-to-day basis and are kept abreast of any developments, revisions, or changes concerning the current plans. Our next emergency plan exercise is scheduled for February 16, 1979.

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Question 6. To what extent are federal, state and local governments included in your program planning?

Answer. We receive valuable training assistance and guidance from the federal Region 5 Defense Civil Preparedness Agency at Denton, Texas. Our key Civil Defense staff personnel attend courses of instruction at Region 5 as well as courses furnished by the Staff College at Battle Creek, Michigan, which provides both home study and resident courses in civil defense planning and operations. Assistance from the Division of Disaster Emergency Services in Austin (State level civil defense) is frequently used to coordinate our actions with host cities and counties. They also keep us informed on civil defense activities of other Texas municipalities. Our Civil Defense Office has also been augmented by assignment of twenty Air Force Reserve Officers from the 9006th Air Reserve Squadron, whose headquarters is at Denver, Colorado. Our Civil Defense Office operates an active training program for these officers, offering a training class consisting of four hours per month of disaster preparedness training and assisting them in arranging for their attendance at the Denton and Battle Creek civil defense courses. These officers have been used during their annual two week active duty tours to accomplish research and complete various projects connected with our Crisis Relocation and Emergency Plans.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. The expense connected with creating the Crisis Relocation Plan was shared by the City of Fort Worth and Tarrant County with the federal government providing matching funds to support eligible projects or expenditures, as well as the administrative expenses and salaries supporting the Fort Worth-Tarrant County Office of Civil Defense. It is felt that the cost of this activity is relatively small considering the benefits derived or expected to accrue from this effort.

Question 8. What duties and responsibilities have been assigned to the various city government agencies and to private industries and public utilities?

Answer. The following agencies have been assigned duties and responsibilities as indicated:

a. City manager.—Assigned the position of Director, Civil Defense. Is responsible for evaluating information and recommendations furnished by the Civil Defense Coordinator and making decisions as to action to be taken by the various agencies involved in dealing with any emergency. Is responsible for directing civil defense actions and furnishing policy guidelines for civil defense staff operations and activities. Directs the coordinated activities of all agencies involved when the Emergency Operations Center is activated by his order to deal with disaster or emergencies.

b. City police department.—This agency is assigned duties in any emergency consistent with its normal functions of law enforcement, traffic control, and protection of life and property. The Chief of Police or his designated representatives will be present in the Emergency Operations Center when it is activated and will direct the actions of the police units involved through the communications facilities provided in the EOC for their use. Police personnel will remain in the risk area during crisis relocation activities to provide law enforcement and protection of lives and property.

c. City fire department.—The Fire Department is assigned duties consistent with its normal functions of rescue and fire fighting activity. The Fire Chief or his designated representatives will be present in the EOC when it is activated so as to direct and coordinate the activities of the various units through the communications facilities provided for their exclusive use in the EOC. Like the police, they will remain in the risk area during crisis relocation periods to assist in protecting lives and property during the absence of the bulk of the populace.

d. Public works department.—Is assigned the tasks in a disaster situation of clearing debris to facilitate movement of emergency traffic, furnishing and erecting barricades where required, placing warning signs and signals to indicate hazards, detours, or restrictions to travel or movement. Furnish equipment and technical skills in support of rescue efforts or hazard removal when requested or directed to do so. Furnish a knowledgeable and responsible official to direct Public Works activities from the EOC during activation and use of that facility.

e. Public utilities.—Are assigned the tasks of neutralizing hazards following a disaster by deactivating electrical circuits where necessary, shutting off gas or water to broken mains or residential systems. Water Department will isolate un-

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needed mains so as to direct maximum pressure and flow to areas where fire fighting activities are in progress. Effect emergency repair of damaged facilities where there is a need for immediate restoration of service due to emergency requirements. Furnish a knowledgeable and responsible individual for duty in the EOC to direct and coordinate the activities of utility crews using communication facilities provided.

f. County sheriff's department.—Assigned the duties consistent with the normal functions of the department of law enforcement, traffic control, and protection of life and property. The Sheriff or his designated deputy will be present in the EOC when that facility is activated to coordinate and direct the activities of departmental units using communications provided.

g. County fire marshal.—Will carry out duties consistent with his normal function of directing and coordinating the activities of County fire units. The Fire Marshal or his designated assistant will be present in the EOC during activation and operation of that facility to coordinate and direct the activities of County fire units.

h. City and county tax offices.—Assigned the duty of assessing property damage and assisting in identifying and locating owners of real property affected by any disaster. Will be available for call if needed to assist EOC operations by gathering or furnishing information for the EOC Director (City Manager).

i. City and county treasurers' offices.—Assigned the duties of making necessary emergency funds available to support actions arising from a disaster or emergency situation. Responsible for safeguarding funds in the event of relocation or evacuation of office personnel.

j. City transportation agency (CITRAN).—This agency is responsible for providing auxiliary transport for evacuees not able to use personal vehicles. Citran will also have a representative in the EOC to coordinate and direct the use of buses for relocation and to furnish transportation for movement of people from disaster areas to treatment facilities or assembly points.

Question 9. Do you have an emergency operating center? Is it in daily use?

Answer. Yes. Our EOC is fully equipped with facilities, situation maps, communications, emergency power source, and emergency communications backup capability. It is located underground between the City Hall and the Police station (Public Safety Building). It will accommodate all necessary personnel from all agencies involved and furnishes each agency with phone communications and radio transceivers operable on the assigned frequencies of the agency concerned. This facility is partially used as an office by the Civil Defense Plans Section during periods of normal operation and this section also has the responsibility for maintaining all EOC maps and facilities in a current and operationally ready condition. The EOC can and will be used for directing and coordinating activities required to deal with natural or man-made disasters as well as activities during crisis relocation and preparation for nuclear attack.

Question 10. Is your plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. Yes. Coordination has been effected to ensure that no conflict exists between the plans of Forth Worth-Tarrant County and Dallas County. Mutual support is available from both areas if needed although no formal agreement has yet been finalized. All host counties have been surveyed by the U.S. Corps of Engineers to assess their support capabilities and the numbers of relocatees assigned to each host area is consistent with surveyed capability. Each host county has been furnished the written annex to our relocation plan that outlines the requirements and responsibilities to be fulfilled or assumed by the host area. Acceptance of our plan and cooperation offered by host county officials has been outstanding.

Question 11. What distances will the evacuees have to travel to host areas? What types of transportation are planned/provided for the evacuees?

Answer. Relocatees will be allocated or assigned to 26 separate counties which are mostly west and northwest of the City of Forth Worth. The farthest distance to be traveled is 280 miles. The nearest host area requires 29 miles of travel. Evacuees will use family cars for transport where available. Public buses will be used to transport those not using their own vehicles. Refueling capability will be provided for those required to travel the longer distances and for those deficient of fuel at the outset. The possibility of using rail transport in the event of a fuel shortage is being explored and appears to be a feasible alternative.

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Question 12. How much time is required to evacuate your city to the host area? For what period of time do you expect the evacuees to remain in the host area?

Answer. We estimate that the last evacuee should depart the risk area within 35 hours of the implementation of the plan. Arrival at the farthest host destination by the last evacuee should occur within 43 hours. These estimates are based on calculations made by traffic engineers and allow for enough extra time to take care of unforeseen problems and delays that could reasonably occur. The plan is designed to support evacuees for a two-week period in the host area. We feel that extraordinary measures can be taken to extend that period if the situation should require such action.

Question 13. Please discuss your logistical plans for supporting the evacuees (plans for food, water, medicine, sanitary supplies).

Answer. Evacuees are being educated by the media and will be instructed to carry all possible supplies with them such as food, bedding, tools, water, sanitary items, etc. Shipments of foodstuffs and other necessities into the risk area will be diverted to host areas to provide ample supplies of these items to the evacuees. Host area plans call for activation of all possible food preparation facilities such as church and school kitchens to augment area restaurant capability to feed the evacuees when their personal food supplies have been exhausted. Host area Red Cross and hospital facilities will be mobilized and augmented by qualified evacuees to provide emergency assistance and medical treatment in sufficient amounts to take care of the assigned number of evacuees. State and federal civil defense offices have resources plans which call for reassignment or relocation of doctors and medical personnel to host areas or disaster areas plus plans for reallocation and diversion of food shipments. These plans are supported by State laws which give the governor authority to direct such actions as are necessary to carry out present plans.

Question 14. What are the plans for reuniting separate family units?

Answer. Our relocation plan does not call for separation of family units except for those families of key personnel who remain in the risk area. These families will all be relocated to the nearest host area and key workers will commute to the risk area as long as this is possible or feasible. Key personnel will be on a two-shift around-the-clock schedule. Instructions will be given evacuees as to actions to be taken to handle inadvertent separation of family members, i.e., identification tags for children, etc.

Question 15. What provisions are made for protection of property during and after evacuation?

Answer. Police and Fire Department personnel are designated as key personnel who will continue to operate in the risk area until forced to cease by actual attack. They will perform their normal functions of law enforcement and protection of life and property. With a two-shift operation and cancellation of vacations and normal days off, more patrol action will be possible to prevent looting or other unlawful activities in the evacuated area. Evacuees will be instructed to secure domiciles and store property prior to relocation wherever possible or feasible.

Question 16. What nuclear radiation fallout protection is provided in the host area?

Answer. Normal expedient shelter facilities such as suitable public buildings, schools, churches, and private facilities such as factories, warehouses, etc., which qualify as shelters will be available to evacuees in the host area. Written instructions for preparation of expedient shelter capability have been furnished host area officials.

Question 17. 100 percent of the population covered by our plan will have sheltered living space designated for them in the host area to which they are assigned. The majority of this space is either qualified as a fallout shelter or can be upgraded to such status.

Question 18. This question is not applicable to Fort Worth-Tarrant.

Answer. County.

Question 19. As mayor of one of the larger cities having dealt with transportation related problems.

a. Do you think population relocation is feasible in a crisis situation?

b. Do you see relocation as a practical solution to increasing the possibility of population survival in the event of nuclear war?

c. Do you think the problems suggested by the previous questions have a practical solution?

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Answer. a. It is our considered opinion, after having studied and worked out our relocation plan for several years, that relocation is entirely feasible in a crisis situation.

b. We do see crisis relocation as a practical solution to greatly increasing the probability of population survival in the event of nuclear war.

c. We have not encountered a problem thus far that has not been resolved to our satisfaction using practical measures that are within our normal capability.

Question 20. Additional comments and information on population evacuation.

Answer 20. Our experience thus far in developing our Crisis Relocation Plan and Emergency Action Plans has led us to the following conclusions:

a. The problems which seemed to be insurmountable when this effort began were resolved largely because we underestimated the willing attitude that has characterized the citizenry of this area and the cooperation we have experienced from all persons concerned with and affected by our relocation and disaster plans.

b. Since the plan is based upon the natural instinct to flee in the face of danger, we feel that cooperation of the populace is assured. We also feel that panic or disorganized action will be avoided through education of the public by media coverage of our plans and programs. Samples of newspaper stories are attached which indicate some of the coverage obtained thus far. We have also had television news coverage to inform the populace of the plan and its provisions for their survival. Our Civil Defense Officers are also giving lectures and slide presentations concerning the plan to civic groups, clubs, school groups, veterans organizations, etc. These presentations have been well received in every instance.

c. The feasibility of the crisis relocation concept is based upon the reasonable premise that the crisis will develop in stages that will permit implementation and execution of the relocation prior to actual attack. In addition, realizing that the Soviets have a plan in existence which provides for evacuation of major urban areas plus a fallout shelter capability far beyond ours, we can see the disadvantage a U.S. negotiator would face knowing that the Soviets had provided for a probable survival rate in excess of 90% for their population while his own country had no comparable capability.

d. The success of any plan developed by any city or municipality will depend to a great degree on timely and accurate information from our federal government as to the status of negotiations or the increase in probability of hostilities. This was not done during the Cuban Crisis and cities would have had no notice or extremely short notice of a missile attack had been launched against the U.S.

e. The feasibility of relocation movement is enhanced by the fact that most of our major cities, where a great portion of their population now reside in suburban areas, experience traffic movement daily that approaches the volume that a relocation would generate.

f. In spite of our first impression that the magnitude of the problems generated by any attempt to relocate our population would make any effort or plan an exercise in futility, we are now convinced that a positive approach has yielded positive results and that any municipality can achieve similar results at a reasonable cost which, with the federal matching funds available, would be within the budgetary limits of most municipalities.

g. It is our feeling, after our experience in researching and developing a Crisis Relocation Plan, that it offers a far more attractive alternative to any intelligent individual than facing almost certain death by staying in a risk area when an attack occurs. We believe that the spirit of cooperation generated by this fact assures us of a high probability of success in executing the plan and saving countless lives as a result.

[Fort Worth Star-Telegram, Nov. 17, 1978]

CIVIL DEFENSE RELOCATION PLAN TO USE ZIP CODES

(By Binnie Fisher, Star-Telegram Writer)

If your ZIP code is 76248 or 76060 and it looks as though World War III is imminent, get ready to take a trip to Jayton in Kent County.

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That is where a new Civil Defense plan, three years in the making, has designated as the relocation area for persons living in those ZIP code areas.

The plan—a prototype for the nation—was developed under the direction of City Civil Defense Planner N. T. Shirley.

The plan is based on the assumption that in the event the United States finds itself on the threshold of another world war, we will have a few days warning before bombs begin dropping.

Shirley explained that there is also a plan which provides for moving Tarrant County residents into local shelters in the event of a surprise attack. That plan, which has been in existence for years, recently has been updated.

He said planners now believe that U.S. intelligence operations would determine if an attack could be forthcoming.

City Civil Defense Director Fred Keish explained, "Our basic plan envisions a period of tension prior to an overt act of war."

Shirley said the Tarrant County planning was begun in 1975, after the United States learned that Russia was formulating a similar plan to move population from its metropolitan areas to rural areas.

"In nearly every category of weaponry, we're outnumbered tremendously (in comparison to Russia)," Shirley said. "Where they are launching ships by the month, we are launching them by the year."

Shirley said projections based on intelligence efforts indicate that Tarrant County could expect as many as seven one-megaton weapons to be dropped within its boundaries.

Ben Myers, also a Civil Defense planner, said the thought that most persons probably have—that anything in the blast region would be destroyed—is not based on reality.

In the 900 square miles that makes up Tarrant County, he said a 50-pecent fatality rate could be expected over 63 square miles of that area.

Even if the entire population of Tarrant County were in the county when the weapons were dropped, Shirley said there would be survivors.

He added that there would be many more survivors if most of the county population was relocated in rural areas prior to the attack.

He said it was decided to relocate persons according to their ZIP code because that seemed to be the easiest way of identifying the population.

Shirley said the plan is one that engineers and Army reservists have worked on. It is so detailed, he said, that booklets have been put together telling the location of shelters in each relocation community.

He said planners know how much food would be available in the various counties, what the water situation would be, where vehicles could be parked and how food would be distributed.

[Dallas Morning News, Nov. 26, 1978]

N-Evacuation Plan Has ZIP

(By Steve Blow)

In case of nuclear attack, check your ZIP code.

President Carter reportedly has decided to bolster the nation's civil defense system by evacuating large cities during threats of nuclear war.

That came as big news to most parts of the country, but Texas civil defense officials thought it was such a good idea they started on it three years ago.

Evacuation plans already are well-developed in the state's most likely target areas, one of which is Fort Worth. It earned the distinction of being a "Priority 1" target because of the Strategic Air Command facilities at Carswell Air Force Base.

So if you live in Tarrant County and your ZIP code is 76011, for example, you should be riding out the next nuclear threat in scenic Cottle County (county seat: Paducah). Furthermore, you should go there via "assigned Route A–6," which is Texas 199 northwest to Jacksboro, Texas 114 northwest to Seymour, FM1919 to FM 267, north on FM267 to U.S. 70 and west to Paducah.

Got that?

If not, don't worry about it. When the crisis comes, newspapers will publish special "crisis relocation" supplements showing which ZIP codes go to which counties—and by what route.

"We figured if we printed it now, people would just lose it," says Fred Keish, Fort Worth civil defense coordinator.

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If the pace of this "crisis relocation" sounds rather leisurely, that's because federal officials have decided nuclear war will come at a leisurely pace.

"The thinking prior to crisis relocation was that there wouldn't be any warning, that there wouldn't be any time to get the people out," Dallas civil defense coordinator John Pickett says.

Keish says, "The thinking now is that the United States would not be hit by a Pearl Harbor-type attack. It would be a slow, building process like the Cuban missile crisis."

Dallas County residents had better hope it is a very slow building process: Dallas' evacuation plan hasn't been prepared yet.

Pickett said Dallas doesn't have a plan yet because it isn't as attractive a target. Because it only has lots of people to offer a nuclear bomber, Dallas is classified a "Priority 3."

Dallas' 30 "host" counties already have been selected, however, and Pickett said the ZIP code assignments probably will be made shortly after the first of the year.

As far as providing food for more than a week, that begins "Phase 2" of the crisis relocation planning. Civil defense officials admit that part will be much more difficult.

As part of Phase 2, officials must decide how food and supplies would be distributed to the widely dispersed population.

They also must decide who would be required to remain behind in the cities to operate essential industries, such as police and fire departments, electric utilities and food processors.

Carter's decision to revive the civil defense system reportedly was based on information that Russia has an elaborate civil defense capable of protecting much of its population. U.S. strategists have worried that the United States' lack of civilian protection would weaken its negotiating position during a threat of war.

Keish says Texas got the jump on the rest of the country because "Texans take things more seriously."

Says Picket: "I just hope we don't get back to the scary Cold War of the 1950s."

[The Dallas Morning News, Dec. 17, 1978]

FORT WORTH'S NUCLEAR CRISIS RELOCATION PLAN PRAISED

(By the Associated Press)

If you live in a large Texas city, but have always wanted to move to the country, you may get your wish if America gets into a serious saber-rattling contest with another nuclear power. If you're already a rural resident, you'll be getting company.

Civil defense is back in the news, largely because of President Carter's request for more money for a population-protecting program.

But in Texas, plans have been going on for more than four years to disperse high concentrations of population should a nuclear war seem imminent.

One of the most well-developed crisis relocation plans has been put together by Fort Worth—a Category 1 target for enemy bombs and missiles. Fred Keish is civil defense coordinator. Category 1 is a high-priority target classification.

The U.S. government . . . knows Russia has a plan like this. We don't want 450,000 (in the Fort Worth area) people used in a hostage concept," Keish said.

Civil defense authorities generally feel any nuclear exchange would be preceded by a slow, building tension similar to the Cuban missile crisis of the 1960s. The feeling is that protection of civilian population would be a high-priority negotiating item during such a building process.

Fort Worth is the only Texas city to base its relocation plans on ZIP codes—the numbers of the codes would determine which of 28 surrounding counties will act as "host" to a given segment of the Fort Worth population.

Fort Worth is a Category 1 target because of its Carswell Air Force Base, which has nuclear strike capability. Other Category 1 targets are Amarillo, Abilene, Austin and Wichita Falls.

There are three categories used for determining risk of nuclear attack. Category 2 targets generally include areas with high military value, but little or no nuclear strike capability. Category 3 targets generally are concentrations of population.

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Keish said Fort Worth was invited to be a prototype relocation program about three years ago. "It made sense to me," Keish said. "It was the only logical option we had other than to sit here and be killed."

Fort Worth investigated using telephone prefixes to determine relocations, but had to scrap the plan because of "Metro" numbers that are not assigned by locale. Postal authorities said the ZIP code plan was workable, and Keish proceeded from there.

The guidelines for relocating population are fairly simple. Host counties are not asked to accept more than two evacuees for every resident, and no community will receive more than 50,000. Key personnel will be designated to remain in the target areas to keep critical functions going.

Newspaper supplements would be used to give evacuation information to residents of target areas. Keish said some briefings have been given to civic clubs, but no all-out information program has been launched. "We figured if we printed it now, people would just lose it," Keish said.

The supplement will detail evacuation routes and destinations and will tell evacuees to carry four days' worth of food, clothing, blankets and other survival items.

"Normal food shipments to Tarrant County also will be diverted to the host counties," Keish said.

Harsh as it seems, the evacuation plans are based on the increased air pressure caused by nuclear detonation. Keish said all those within a 2-pound-per-square-inch increase radius from the presumed blast would be evacuated. "Those beyond two PSI will be allowed to stay," Keish said. "That is a lenient figure for survival."

Keish said a 5-megaton weapon would produce the 2 PSI increase within about a 14-mile radius.

Statewide coordination of relocation plans is handled by Disaster Emergency Services, through the Department of Public Safety in Austin.

State planner Larry Ayres said there are 34 high risk areas in the state that would be evacuated. He said all but Houston and Dallas have begun to formulate evacuation plans.

"We're trying to gain as much experience as possible in working with the smaller areas before taking on our two biggest population centers," Ayres said. He said evacuation allocations for Dallas and Houston would probably be completed by late 1979.

Ayres said he believes Texas is ahead of other states in formulating evacuation plans. He said any increases in funding probably would be used to update the plans rather than inaugurate them. "Our progress is mostly determined by Corps of Engineers survey teams that determine what areas can accept evacuees," Ayres said.

Expenses involved in the plans are initially borne by the State of Texas, but Ayres said the state is reimbursed by the federal government.

He said about 8 million Texans would be relocated in a nuclear emergency.

Not all host counties are in Texas. Ayres said 11 Oklahoma counties and four in New Mexico have agreed to act as hosts for evacuees.

Should the word come from Washington to implement the evacuation plans, individuals would be asked to provide their own transportation if possible. Otherwise, school buses and other forms of transportation will be provided. No military transportation is anticipated.

Evacuees and residents will be housed in authorized shelters, such as gymnasiums and other buildings deemed safe by civil defense officials.

Hill County Judge Gordon Eubank said his county will act as a host for part of McLennan County. "The general public is not aware of the impact an evacuation would have, but all the reaction has been very positive so far," Eubank said. "There haven't been any protests or anything like that."

He said the total plan seems workable to him.

"We're happy to be a host county," he said, "rather than one that has to be evacuated."

Here are Texas "risk" areas that would probably serve as targets for enemy missiles and bombers in the event of nuclear war, according to Disaster Emergency Services in Austin.

Likelihood of attack declines from Category 1 through Categories 2 and 3. At least portions of the "risk" areas would be evacuated in event of attack.

Category 1: Amarillo, Austin, Abilene, Wichita Falls and Fort Worth.

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Category 2: San Antonio, Corpus Christi, Beeville, Kingsville, Texarkana, El Paso, Houston, Sherman-Denison, Big Spring, Lubbock, San Angelo, Del Rio and Laredo.

Category 3: Bryan-College Station, Brownsville-Harlingen-San Benito, Dallas area, Odessa, Galveston-Texas City-La Marque, McAllen-Faun-Edinburg, Beaumont-Port Arthur-Orange, Waco, Midland, Carson County, Tyler, Bell County, Brazoria, Chambers County, Fort Bend area, Gregg County, Harrison County, Kaufman County, Liberty County, San Patricio County and Smith County.

FORT WORTH AND TARRANT COUNTY CIVIL DEFENSE,
January 17, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs, Washington, D.C.

DEAR SENATOR PROXMIRE: Attached is a letter and a summary of the Fort Worth-Tarrant County Crisis Relocation Plan that was recently sent to Mr. Bardyl Tirana. This is forwarded to you so that you may gain some idea as to the expense to the taxpayer of generating crisis relocation plans as opposed to that which a full scale blast/fallout shelter program would involve.

As we pointed out in the attached information; much of the groundwork to generate basic planning factors can be accomplished by agencies whose services are available to civil defense planners without, in most cases, extra expense to the taxpayer.

You will note that we used the Army Corps of Engineers and the Army Civil Affairs Reserve Group to accomplish much of the basic research needed for formulating the plan. We also used, on a continuing basis, Air Force Reserve Mobilization Designee personnel to do much of the basic planning research. These people, who perform two weeks active duty per year, undergo training in disaster preparedness and are a valuable adjunct to the civil defense effort when they are properly trained and monitored by civil defense officers.

The use of these agencies, which are already funded and are actually seeking projects that will give their people meaningful tasks to accomplish, is a way of keeping the costs of the program within reasonable bounds and within the capability of most of the municipalities concerned.

If you desire any further information concerning our efforts in crisis relocation planning, please feel free to call upon us.

Sincerely,

FRED C. KEISH,
Coordinator,
Fort Worth-Tarrant County Civil Defense.

January 12, 1979.

MR. BARDYL TIRANA,
National Director, Defense Civil Preparedness Agency, The Pentagon, Washington, D.C.

DEAR MR. TIRANA: I am forwarding for your information a copy of the answers prepared by this office to a questionnaire sent out by Senator Proxmire's office. Included are copies of newspaper articles that have appeared in this area concerning Fort Worth's Crisis Relocation Plan.

We in the Fort Worth-Tarrant County Civil Defense Office feel very strongly that the concept of crisis relocation is a workable and feasible method for offering millions of people a chance to survive a nuclear exchange. The fact that any such exchange will result in the death of millions does not, we feel, relieve the government of the obligation to offer a method for survival if such a method is within the capability of the government to provide it. If the survival of a large portion of the populace in every target area is possible by working out a comparatively inexpensive and feasible plan, does it make sense to make the effort to provide such a plan? We feel that it does make sense and we are not hesitant in attempting to education the citizens of Tarrant County as to what we are doing and why we are doing it.

We would agree that a plan such as ours probably would not be workable or feasible for a municipality such as New York City where the population density

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of the surrounding area is such that hosting several million people would be impossible. We do contend, however, that the concept we are using could be effective in many areas involving millions of citizens and that other alternatives could be worked out for those areas unable to use this concept. Alternatives would surely be more expensive than the relocation concept, which makes no expensive demands for food storage, shelter construction, etc.

Those who say that relocated people in large numbers cannot be housed or fed in host areas have not looked deeply enough into this area to speak with authority. Our plan is based on thorough research which indicates that adequate facilities and care can be provided in the host areas.

It is obvious, from reading negative comments by respected public officials regarding the crisis relocation concept, that there is not enough information available to them on the concept and that they have no real understanding of it.

Attached is a summary of the plan as we have conceived it, which covers the concept, the actions involved and the basis for our belief that all of the ingredients are readily available to successfully carry out the primary intent of the plan, namely, to offer a large percentage of our populace an opportunity to avoid certain death.

We solicit your support for our efforts and for the basic concept of crisis relocation. We would welcome any questions or inquiry concerning our activity in the area of crisis relocation planning, as well as any other area of Civil Defense responsibility.

Very sincerely yours,

FRED C. KEISH,
Coordinator,
Fort Worth-Tarrant County Civil Defense.

Exclosures.

FORT WORTH-TARRANT COUNTY CIVIL DEFENSE—CRISIS RELOCATION PLAN

CONCEPT

The concept of crisis relocation is to move people far enough from a target area prior to a nuclear attack so that they are afforded safety from the blast and thermal effects of a nuclear detonation and as much protection from fallout radiation as planning and available facilities can provide. This concept also provides continued support for the relocated persons for an extended period.

This concept is based on the primary assumption that, when faced with the high probability of a nuclear attack which will strike the area where he resides, the normal thinking citizen will have one thought uppermost in his mind, namely, "What can I do to stay alive?"

With this in mind, the planner does not concern himself with the fact that a lot of people will be leaving behind a living style replete with varying degrees of luxury to journey to a place where he may be sleeping on a gymnasium floor in a sleeping bag and eating box lunches for a period of days or weeks. In other words, the objective is to keep people alive; to offer them a chance to survive; not to try to preserve their particular life style.

ASSUMPTIONS

In formulating the Crisis Relocation Plan, the following conditions or facts were assumed:

1. That a gradual deterioration in relations or negotiations would afford ample time for making the decision to implement and execute the plan prior to an attack.
2. That the volume of vehicular traffic involved would require that approximately 48 to 72 hours would be required for completing the relocation movement.
3. That the great majority of relocating persons would provide their own transportation.
4. That relocated persons would require support in the host area for a period of two weeks or longer.
5. That essential industries and key government functions in the target area would continue to operate up to the point where attack has been launched and that approximately 15% of the population would be engaged in this effort.

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6. That logistics support for relocated persons can be maintained for the duration of the emergency.

7. The approximately 20% of the population of Tarrant County would either refuse to leave their homes or would act independently before the plan was implemented to move to personally selected sites or shelter owned by themselves or by relatives or close friends.

8. That a total of approximately 680.000 persons would be relocated from Tarrant County to host areas.

SOURCES OF PLANNING FACTORS

In addition to the extensive research carried out by the local Civil Defense Office, two major projects were supported by other government agencies.

The Army Corps of Engineers, under the supervision of the Texas Division of Disaster Emergency Services Office, was given the task of surveying the host counties involved to determine the number of relocatees each host area could support with housing, sanitation, food, and emergency medical services.

At the request of this office, an Army Civil Affairs Reserve Group carried out the task of surveying food requirements and resources to determine how much food would be required and what sources could provide it. They also surveyed the food distribution system to determine whether the system in existence was adequate to the task of supporting the relocation. The Civil Affairs Group's contribution to the plan also included a computer print-out which contained all of the necessary data on food requirements, sources, and distribution capability that was available for supporing the relocation plan.

The mangement of food distribution in support of this plan will be through the Texas Emergency Resource Priorities Board in accordance with the Texas Emergency Resource Management Plan, which is currently being revised and updated.

The Fort Worth City Traffic Enginering Department provided research data concerning the movement of the necessary vehicular traffic out of the county.

Data was obtained from the major oil companies in the area regarding support of vehicle fuel requirements for the relocation.

Information in the number of people in each Zip Code area was obtained from the U.S. Postal Service.

Planners from the Texas Division of Disaster Emergency Services Office assisted in the preparation of this plan.

RELOCATION PLAN SUMMARY

Using the data on host-county capability for 26 counties west and northwest of Fort Worth, the population of Tarrant County was allocated by Zip Code numbers to host counties to be used under the plan. There were three criteria used in this process:

1. Numbers of relocatees assigned each county would be less than the computed capacity of that county as calculated by the Corps of Engineers.

2. The aggregate population of each host area population center would not total more than 50,000 after the relocation is completed.

3. The ratio of relocatees to local population would be less than 3 to 1.

All host counties have received the annex to the basic plan which outlines their particular support requirements. State Civil Defense planners have negotiated agreements with the officials of each host area for this support.

Those persons declared to be key personnel for continuing the essential industrial and governmental functions will be relocated to a nearby county which, while being outside the radius of primary effects of a nuclear detonation, would be within commuting distance of their job location so that they could work 12-hour shifts in the target area.

Notification of the implementation of the relocation plan and instructions as to actions each citizen should take to relocate will be accomplished by a "media blitz" through newspapers, television, and radio. A "camera ready" supplement for the local newspaper is being prepared and would be published and distributed with the newspaper. It would contain comprehensive instructions to inform the individual where he will relocate, what he should take with him, when he should depart, and the route he should follow.

A program for informing the public on the plan is presently being carried out through newspaper articles, television and radio interviews, etc. Briefings are

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also being given all possible civic organizations and clubs in the area on a continuing basis. Considerable interest among the public has been generated and daily inquiries are received by this office from citizens who have questions concerning the plan and desire information on preliminary actions they could take to prepare for emergencies of all types.

GENERAL COMMENTS

We feel that much of the negative reaction to the concept of crisis relocation results from either ignorance of the objectives of the concept or an unwillingness to do the work necessary to bring a plan into being.

The fact that the concept is based on the inherent desire of an individual to survive or to flee in the face of a certain disaster affecting himself and his family will, we believe, ensure public acceptance and cooperation in carrying out a plan that offers the chance to follow their natural instincts. We do not intend to beg people to relocate nor do we have the authority to order them to do so. This is why our planning factors allow for relocation of 80 percent of the population rather than 100 percent.

It is felt that building permanent blast shelters or shelters specifically constructed for fallout protection in target or host areas as the Soviets have done is too expensive to be practical if there is an alternative that is more reasonable in cost that would still offer a measure of survivability.

We believe that crisis relocation is the alternative that does offer a reasonable and feasible answer. Since host areas have been selected to take advantage of prevailing winds and distances which decrease the fallout hazard, the survival odds are enhanced and, with the plans that have been furnished host areas regarding construction of makeshift or temporary fallout protection, they can quickly generate facilities to meet most, if not all, of the needs for this protection.

The training and education of the public through a strong information program is, we feel, the responsibility of our Civil Defense Office and we have been fairly successful in promoting this program locally through working with highly cooperative media resources. Those Civil Defense officials who urge that we "not pour our money down a rat hole in support of an unrealistic system" should realize or face the fact that only the hard work and dedication of Civil Defense officials themselves, plus the necessary support of government at all levels can ensure that a "realistic" system will exist.

The Fort Worth-Tarrant County Civil Defense Office began work on the Crisis Relocation Plan in 1975 and our present plan was prepared with no increase in support or funds from any source. This was possible through judicious use of resources and assistance available to us such as the use of the Corps of Engineers and the Army Civil Affairs Group, as well as the expertise of local and State governmental agencies and private industries who gave their willing cooperation. The primary factor was, however, a positive attitude on the part of our Civil Defense staff and an unwillingness to assume that something was impractical or not feasible until a thorough research effort was made and all avenues were explored in solving the problems involved.

GALVESTON COUNTY, TEX.,
EMERGENCY PREPAREDNESS OFFICE,
Dickinson, Tex., January 4, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing, and Urban Affairs,
Washington, D.C.

DEAR SENATOR PROXMIRE: We appreciate the opportunity to offer the following information:

Question 1. Do you now or have you ever had a population evacuation plan for your City? If so for what purpose?

Answer. We have a Nuclear & Natural plan for Galveston County.

Question 2. Is your plan equally applicable to Natural disasters & Nuclear alert situations? If not, describe the differences and how your plan deals with these differences.

Answer. No. Being on the sea coast we cannot move through Houston on a Nuclear attack, but can on a Hurricane evacuation, because Houston would not be evacuating.

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Question 3. If you have a population evacuation plan, has it ever been tested? What were the results of the test?

Answer. Has been tested, it does have loop holes in it that we are studying now. We have had some success in Hurricane evacuation though.

Qustion 4. What division or office in your City government is responsible for population evacuation?

Answer. Civil Defense, Emergency Preparedness Office.

Question 5. How often are your population evacuation plans and operations reviewed by City officials, State or Federal officials?

Answer. Not too often.

Question 6. To what extent are Federal, State and Local governments included in your program planning?

Answer. We have excellent State and Federal cooperation with our planning and their guidance is needed. The State had an excellent Crisis Relocation Planning division that works with us locals.

Question 7. What financial resources were used to develop your population evacuation plan?

Answer. State funds.

Question 8. What duties and responsibilities have been assigned to the various City government agencies and to private industries and public utilities?

Answer. Traffic control is coordinated by County Civil Defense as there are 13 political entities in the County of 200,000 population, we work directly with Police, Fire & Sheriff's departments in the County, through a command radio net worked in our EOC.

Question 9. Do you have an emergency operating Center? What capabilities does it have? Is it in daily use?

Answer. Yes, we have 5300 sq. feet under ground and it is manned 24 hours daily, we also have food for 52 people for 14 days. We have emergency electrical & water system and emergency sewer system. We transmit on 47 different radio frequencies, we talk direct to our County population by a regular broadcasting Radio station located in Houston from our EOC. We have radio teletype and weather facsimile machine, plus closed circuit television for data display and will terminate a 911 telephone system here.

Question 10. Is your evacuation plan coordinated with plans of neighboring metropolitan areas and host areas?

Answer. To some degree as we are in direct communication and have mutual aid agreements. None to our host areas.

Question 11. What distances will the evacuees have to travel to host areas? For what types of transportation are planned/provided for evacuees?

Answer. Distance to Host area is about 200 miles, not too much preparation has taken place. We are in a planning stage now.

Question 12. How much time is required to evacuate your City to the Host area? For what period of time do you expect the evacuees to remain in the Host area?

Answer. We are studying this now with traffic count etc., time frame would have to be flexible based on the type disaster, and amount of population required to move.

Question 13. Please discuss your logistical plans for supporting the evacuees (Plans for food, water, medicine, sanitary supplies).

Answer, We have two 200 portable hospitals to be moved, other things are not too well planned, distribution of food and other necessities for evacuation areas.

Question 14. What are the plans for reuniting separate family units?

Answer. None, except through the Red Cross. This is up to Host area ability, we have two way radios in our EOC on the Red Cross frequency.

Question 15. What provisions are made for protection of property during and after the evacuation?

Answer. We definitely expect to maintain protection, using Police, Fire and other support agencies such as the State Guard. These departments will not be evacuated.

Question 16. What Nuclear radiation fallout protection is provided in the host area?

Answer. In our case none that we know of to any great extent.

Question 17. What percent of the population covered in your plan has designated shelter areas?

Answer. Very little, as our shelter program has been neglected over the years and population growth has made such plans obsolete.

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Question 18. If you do not have a population relocation plan and were to develop a plan, what would the focus be: Natural disaster, Nuclear Emergency or dual purpose (Both Natural Disaster & Nuclear Emergency)?

Answer. I think all plans should be directed towards both.

Question 19. As Mayor on one of the larger cities have dealt with transportation related problems.

(a) Do you think population relocation is feasible in a crisis situation?

As a Civil Defense Coordinator, it is at this time the only way we would be able to save the most lives as our terrain does not permit under ground shelters.

(b) Do you see relocation as a practical solution to increasing the possibility of population survival in the event of Nuclear War?

Yes in the critical areas as of now, based on present population protection plans. Population relocation would save more lives than any other plan we have.

(c) Do you think the problems suggested by the previous question have a practical solution?

Answer. Yes under the new Federal Agency FEMA, I believe for the first time we are making progress toward a strong Civil Protection Program whether it be Nuclear or Natural.

I believe that in our National Highway building program, where we are building overpasses on Federal Funded Highways the cost of protection shelter in the overpass would be ½ of 1 percent of the total highway cost, this would give us a place to shelter our population during population relocation and it would be economically feasible with cost being shared by FEMA and Transportation.

Yours very truly,

W. R. BRADY, *County Coordinator.*

PART II PLANNING REPORT, GALVESTON COUNTY

The Galveston County Crisis Relocation Planning (CRP) was commenced in October 1977, concurrent with Brazoria County planning. Originally, ADAGIO planning indicated that Brazoria and Chambers counties would be able to relocate within their own boundaries and were not assigned an outside host area. However, a detailed analysis of the Texas coastal area precipitated a multitude of changes. Refer to the Coastal Bend Conglomerate and Brazoria County Crisis Relocation Plans and planning reports for additional background information. To summarize, the current risk-host areas are outlined for information:

1. Galveston County risk-host area (Coastal Plains Conglomerate): For all practical purposes, the entirety of Galveston County is within the risk area. Key workers are to be hosted in Angleton (Brazoria County), with general public relocatees assigned to Matagorda, Calhoun and Victoria counties. Victoria County will host relocatees from the northern Mainland section of Galveston County, in addition to all general public relocatees from Brazoria County (in approximate equal numbers).

2. Brazoria County risk-host area: Two separate risk areas (Brazosport area and northeastern county), combined with the allocation of Galveston County key workers to Angleton, necessitated relocating Brazoria County relocatees to Victoria County, along with some Galveston County relocatees.

3. Corpus Christi risk-host area (Coastal Bend Conglomerate): Four separate risk area EPI's were produced (Corpus Christi, San Patricio County, Beeville-Bee County and Kingsville-Kleberg County). Counties included in the conglomerate are: Aransas, Bee, DeWitt, Goliad, Karnes, Kleberg, Live Oak, Nueces, Jim Wells, Refugio and San Patricio. In the initial ADAGIO planning, Goliad County was assigned to Galveston. Goliad County was reassigned to the Coastal Bend Conglomerate.

Initially, Victoria County was not allocated to any risk area, due to its relatively large population (nearly 50,000), though not listed as a risk area. As planning developed, it became apparent that Victoria County would require utilization as a host area, to maintain a reasonable and equitable hosting ratio within the geographic restrictions placed upon the Galveston risk area.

During initial planning stages, many various alternatives of relocatee allocation and traffic routing were considered and rejected. The geography of Galveston County and the fact that Houston will be simultaneously relocating severely restricts normal day-to-day traffic flow patterns. It was finally agreed that no relocating traffic would be allowed to enter Harris County on I–45. Several

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different mixes of county divisions and routing traffic off of Galveston Island were considered at some length before deciding on the options outlined in the EPI prepared. The most apparent alternative (and the primary one considered throughout initial allocation development) was to divide the Mainland into eastern-western sections, utilizing I–45 as a divider. However, local input plus an overview of the traffic flow patterns to be utilized, raised many obstacles using this method. With a minimum of exit route alternatives, the ultimate host destination was also a major consideration. Primary considerations were to evacuate the population most expeditiously, with a minimum of travel through other risk areas, and avoidance of traffic congestion, particularly in Brazoria County. The coincidence of a hurricane threat to the coastal area occurring simultneously with crisis relocation was considered negligible, permitting planning use of coastal highways. Traffic routing analysis is detailed in Attachment 2.

Population figures were based on the best estimates available from a variety of sources to accurately depict the current and immediate future population distribution. Estimates are primarily derived from the Census Bureau, Texas Almanac and local government officials.

Guidelines and instruction for traffic control and specific internal routing are the subject of the Galveston County Emergency Operations Plan Annex (CRP) which will be published separately. Essentially, all of Galveston County's relocating traffic will be entering and/or transiting Brazoria County en route to Calhoun, Matagorda or Victoria counties. The only exception is those Bolivar Peninsula residents (approximately 2400), which would relocate to the northeast through High Island and north to Tyler County. Galveston Island population near the San Luis Pass bridge is negligible for planning purposes.

Galveston Island experiences a very large tourist population in the summer months. However, this was not considered to be a major planning factor, as tourism is expected to decline during the "increased readiness phase" posture and the majority of "summer-home" residences will not be occupied.

EMERGENCY OPERATION PLAN STATUS

The Galveston County EOP is currently undergoing major revision and updating. It should be completed and printed in the very near future. This plan will make provision for inclusion of a CRP Annex. No further action on our part is necessary.

The only cities in the county with CD staff on P&A are Galveston and Texas City. The status of their plans are:

Galveston—dated August 22, 1974 (prepared by DES.)

Texas City—dated December 1, 1972 (prepared locally and needs updating and/or re-writing.)

All other cities have non-existent or bare skeleton plans. Generally, Galveston County covers all CD matters, except for the two largest cities (Galveston and Texas City).

DONALD L. JONES,
Project Officer.

ATTACHMENT 1

GALVESTON COUNTY ALLOCATIONS

[Total estimated population (1978)=200,000; population figures below in thousands]

Risk area	Population	General relocatees	Key workers	Host county
Galveston Island	66.6	46.6	[1] 6.6	Matagorda.
Hitchcock	6.0	3.9	.9	Do.
G–I area total	72.6	51.5	7.5	
C area total (Bolivar)	3.4	2.4	.4	Tyler.
Texas City	45.0	27.0	[2] 9.0	Calhoun.
LaMarque	18.0	11.7	2.7	Do.
G–S area total	63.0	38.7	11.7	
G–N area total	61.0	39.6	9.2	Victoria.
County total	200.0	132.2	28.8	

[1] 10 pct.
[2] 20 pct

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"G–N" area population is based on each town (including surrounding area) as follows:

	Percent
Algoa	1
Alta Loma	2
Arcadia	2
Bacliff	5
Clear Lake Shores	2
Dickinson	18
Friendswood	8
Kemah	2
League City	16
San Leon	5
Total	61

Key workers (and their families) were calculated on the "standard" basis of 15 percent of the total population throughout the county, except for the cities of Galveston and Texas City. Ten percent was used in Galveston, due to the predicted relatively small number of essential industries on the Island. However, Texas City was increased to 20 percent "key workers" due to the heavy industrial complex. This leaves to total county calculations just short of the "standard 15 percent".

RECAP: RELOCATEES ASSIGNED

Host county	General population relocatees	Key workers	Note
Brazoria		28.4	All hosted in Angleton.
Calhoun	38.7		Based on predicted capacity (2.5:1 ratio).
Galveston		.4	Hosted in High Island.
Matagorda	51.5		Based on predicted capacity (2:1 ratio).
Tyler	2.4		Shared with Beaumont area relocatees.
Victoria	39.6		Shared with Brazoria County relocatees (additional 50,000 relocatees, making approximately 2:1 ratio).
Total	132.2	28.8	

Note.—Although Calhoun County is more heavily taxed, their predicted congregate care capacity will be correspondingly higher than that of Matagorda County, based on best estimates available without a C of E survey. Estimates may necessitate revision upon receipt of survey results. Current allocations will escalate Victoria City total population (relocated mode) to approximately 140,000. It is recognized that this contradicts desired planning guidelines, but represents the best compromise within the constraints applied.

ATTACHMENT 2

TRAFFIC ROUTING ANALYSIS

ASSUMPTIONS

A. Only out-bound lanes of major highways will be used.

B. Lane capacity is 1,000 vehicles an hour per lane.

C. Average travel speed will be 25 m.p.h. (reduced due to local unique geography).

D. Vehicle occupancy will average 3.0 persons/vehicles.

E. I–45 is considered one-lane only due to exit situation at Hwy. 6 and FM 2004.

F. Some origination areas will merge with other relocating and essential traffic.

G. Brazoria and Harris County traffic (Harris is not yet calculated) will impose additional burdens.

H. Merging traffic originating in Galveston County and Brazoria traffic is considered and included in these calculations.

I. Although causeway capacity is rated at 4,000 vehicles/hr. under normal conditions, that flow rate could not be attained during crisis relocation, due to the necessity to exit I–45 onto a one-lane ramp.

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Origination area	Route	Mileage	Approximate number of vehicles	Exit time (hours)	Trip time (hours)	Total movement (hours)
Galveston Island	I-45/6/2004	@100	[1] 20,000	20	4	24
(To: Matagorda County)	3005	@100	10,000	10	4	14
Galveston-North (To: Victoria County)	Highway 6/U.S. 59	@150	[2] 12,000	12	6	18
Galveston-South (To: Calhoun County)	FM 2004/35	@150	20,000	20	6	26

[1] The portion of G-I traffic exiting via I-45 will merge with G-S traffic on FM 2004.
[2] Includes Brazoria County.

Note.—Planning has attempted to minimize conflicts of general relocating traffic and "key worker" traffic. However, some degree of mix is inevitable, particularly on Highway 6 and FM 2004 to Angleton. Note exit options for G-1 traffic noted in EPI. That degree of traffic interference (unpredictable until pt. IV planning is accomplished) will corespondingly increase the travel times noted above by a relatively small probable percentage.

WACO-MCLENNAN COUNTY CIVIL DEFENSE,
Waco, Tex., January 3, 1979.

Hon. WILLIAM PROXMIRE,
Committee of Banking-Housing and Urban Affairs,
Washington, D.C.

In response to your twenty questions form sent to five largest Texas cities, I would like to make the following comments for your guidance and information. Waco and McLennan County, has a population evacuation plan, this plan is presently being updated and we find by the state civil protection organization using federal funds. The input to this plan has been developed at local, state and federal level. This community favors a population evacuation to low risk areas in event of a nuclear attack. This plan has been coordinated with the county judges of Hill and Falls county by the local CD director and states Texas State plan hours. It is in my opinion that the Federal Government should further plan the population evacuation as a dual purpose plan. We are confident that we can make this plan work in the event and crisis involving a nuclear attack against the USA. We need federal funding for the entire USA population evacuation from high to low risk areas. We are aware of the great logistical problem involved in such a crisis relocation of our population. In order to save as many lives as possible despite the hardship involved, we must have a passive plan of crisis relocation nature (CRP). Solving the logistical problem involved would require great effort on the part of our Federal government jointly with the State and local subdivision. There is very little fall out protection in the host counties of Falls and Hill county. Emphasis must be placed on the improvising of fall out shelters. McLennan county, a high risk area has adequate fall out shelter space for its population. The preparation of population evacuation planning (CRP) for nuclear attack should be intensified and continued. I believe the population relocation during a nuclear crisis can be a practical solution for the Waco-McLennan county area. Larger cities will have more problems, but together with local, state and Federal planning and funding, we can save millions of lives if our country is attacked by nuclear weapons. The concept of population evacuation prior to a nuclear crisis confrontation is practical. Early warning and intelligence must be provided by the Federal government in order that a population evacuation could succeed. I think it can.

Maj. RUFUS J. CLEGHORN,
Director.

STATE OF UTAH,
COUNCIL OF DEFENSE,
Salt Lake City, Utah.

The State of Utah has population evacuation plans which provide for the evacuation of metropolitan areas in the event of a natural disaster of a threat of nuclear war.

The plans are equally applicable to natural disaster and nuclear alert situations. Natural disaster plans are based on the premise that the disaster would be localized and the evacuation may be to other metropolitan areas most capable of

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handling the evacuees. Nuclear alert evacuation plans are based on the premise that all metropolitan areas would be risk areas so that all of them (Salt Lake, Ogden, Provo, and surrounding SMSA's) would be evacuated simultaneously to rural nonrisk areas.

The population evacuation plans have not been tested.

State and County Directors of Emergency Services are responsible for planning and coordinating population evacuations. All major State, County, and City agencies are assigned functional responsibilities in carrying out the plans.

Population evacuation plans are reviewed by State and County officials after they are initially written. Repeated reviews on a frequency basis have not been addressed.

State, County, and City governments are fully included in the evacuation planning since their coordinated efforts will be needed to accomplish the evacuations and hosting of the populations in host areas.

Federal DCPA funding was used to develop evacuation plans for nuclear alerts. Federal FDAA funds were used to develop plans for natural disaster evacuations.

Local governments have been assigned the responsibilities of direction and control of the evacuation and hosting, control of resources.

The State of Utah has an Emergency Operating Center and an alternate. Major metropolitan area, Salt Lake City/County, Ogden/Weber County, Davis County, and Provo/Utah County have EOC's. They are all in daily use.

All of the evacuation plans for metropolitan areas in Utah are coordinated for all areas in the state and provide for evacuation of all of Utah's risk population to host areas within Utah.

Evacuees from metropolitan areas in Utah will have to travel from 30 to 310 miles, depending on which host area they are assigned. Plans call for the use of private vehicles and for public transportation for those unable to travel by private vehicles.

All metropolitan areas are planned to be evacuated and relocated to host areas within 3 to 34 hours depending upon the distance to the host area. Plans are for the evacuees to remain in the host area for two weeks and will depend on the length of the crisis.

Logistical plans for supporting the evacuees: Food: Plans are for USDA to control food supplies down to wholesale levels. Department of Agriculture handles food requirements. Water: Most host area water systems are from enclosed springs and wells and will provide potable water during the emergency. Medicine and Sanitary Supplies: The State Department of Health is responsible for redistributing medicines and sanitary supplies to host areas.

Evacuation is planned in family units. Host areas are assigned to evacuating census tracts so that all residents of specified tracts are to go to assigned host areas. Should family members become separated, welfare and voluntary organizations are assigned the responsibility for inquiry centers and family assistance.

Minimum essential police forces will commute from the nearest contiguous host areas to the evacuated risk areas to provide security for property and resources.

All available existing fallout shelters in the host areas will be used to shelter the host area residents and evacuees up to the fullest capacity of these shelters. For those remaining needing shelter, the most protective facilities will be upgraded by using earth and most advantageous construction to provide expedient fallout shelter.

Only a small percent of the evacuees in the host areas will be given designated existing shelter. Most of the evacuees will be sheltered in upgraded expedient shelter.

Utah has population relocation plans for both natural disaster and nuclear emergency. However, on the basis of effort and time evacuation planning for nuclear emergency requires far more planning effort since it involves moving all metropolitan population simultaneously to all host areas in the state.

(A) Population relocation for metropolitan areas in Utah is considered feasible; (B) population relocation for nuclear emergency is the most practical solution to increasing survival, and (C) within Utah it is practical and feasible to evacuate metropolitan areas to host areas in preparation for nuclear attack.

Recommend continuation of crisis relocation planning at present level or increased level.

DONALD R. SPRADLING,
Executive Director.

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COMMONWEALTH OF VIRGINIA,
STATE OFFICE OF EMERGENCY AND ENERGY SERVICES,
Richmond, Va., January 3, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing, and Urban Affairs, Washington, D.C.

DEAR SENATOR PROXMIRE: Answers to questions relating to population evacuation of metropolitan areas in Virginia are presented below. These answers do not apply to any specific metropolitan area, but apply to all in general based on our experience in coordinating the development of disaster preparedness plans and programs for the State over a number of years.

1. No political subdivision of Virginia has a plan for evacuation of its total population. Most local jurisdictions have plans to provide for evacuation of citizens threatened by floods or transportation accidents involving hazardous materials. Those jurisdictions within a ten-mile radius of a fixed nuclear facility have plans to evacuate the population located within this area; and hurricane evacuation plans are currently being developed for extensive areas of the Eastern Shore and Tidewater jurisdictions of the State.

2. These plans are not equally applicable to natural disasters and nuclear alert situations. Peacetime evacuation plans involve movement of relatively small numbers of persons for short distances compared to relocation of all personnel from principal population centers up to several hundred miles in a nuclear alert. Plans for evacuation during a nuclear alert must also provide for protection of the relocated population against radioactive fallout in rural host jurisdictions; consider disruptions in normal commerce, money, and banking systems; and provide for extensive reorientation of logistics support (flood, fuel, transportation, health, etc.) systems.

3. Plans for evacuation of populations from areas within ten miles of fixed nuclear facilities have been evaluated in simulated exercises, i.e., warning systems have been tested, roadblocks and traffic control have been simulated, evacuation centers have been opened, etc.; but the population has not actually been evacuated. Flood evacuation plans have been tested in actual disasters.

4. The Director of Emergency Services (the Mayor or City Manager as designated by the City Council) of each city is responsible for coordinating implementation of city evacuation plans. Many city government departments, quasi-public and volunteer relief agencies have a role to play in these operations.

5. The frequency of review of population evacuation plans by city officials varies. The State goal is an annual review.

6. The State seeks out technical assistance from various Federal agencies in defining peacetime disaster hazards. The State then assists local government staffs in developing peacetime disaster evacuation plans. Nuclear alert evacuation planning for local governments is accomplished by Federally-funded State employees under rigid, but incomplete Federal guidance. Under present Federal funding levels, 10 to 12 years will be required to complete nuclear alert evacuation plans for the State. Based on past experience, we believe Federal program emphasis will change before these plans are completed.

7. Defense Civil Preparedness Agency funds are used to develop local government nuclear alert evacuation plans. However, this requires considerable involvement on the part of local government staffs for which there is no reimbursement. The local governments bear the cost of developing peacetime disaster evacuation plans with technical assistance being provided by the State.

8. City government agencies are assigned emergency responsibilities consistent with their capabilities. Mutual support agreements are negotiated with private industries based on need, and public utilities provide liaison and are responsible for maintenance of services and providing special requirements in emergencies.

9. Twenty-seven (27) of the 136 local jurisdictions of Virginia have EOC's constructed with Federal funding assistance; 18 have locally-constructed EOC's. These facilities have communications for warning and coordination of emergency operations, emergency power, situation rooms, and operating space for emergency staffs. They are, in most cases, used on a daily basis for central dispatch of emergency services units.

10. As they are developed, nuclear alert evacuation plans are coordinated with neighboring metropolitan and host areas. Natural disaster evacuation plans are coordinated with neighboring jurisdictions when necessary.

11. Evacuee travel distances will range up to 320 miles with the average estimated to be about 100 miles. This is based on the requirement to host the popula-

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tion of the District of Columbia, Prince Georges and Montgomery Counties of Maryland in Virginia. Private vehicles and public ground transportation will be used.

12. Movement plans are not complete; however, we expect a minimum of 72 hours will be required to evacuate all high-risk populations to host jurisdictions. We anticipate evacuees would remain in host jurisdictions a minimum of seven days once the evacuation plan is implemented.

13. Logistical plans to support nuclear alert evacuation have not yet been developed. Much of this planning, particularly that pertaining to food, petroleum, transportation, and postal services, will require close coordination with responsible Federal agencies; and to date, we have no evidence that these Federal agencies are developing national plans to manage these resources. Other important areas that have apparently not been addressed by Federal agencies include money and banking, economic stabilization, social security, and welfare. The states need information on these national plans before they can develop meaningful plans for the host jurisdictions.

14. We plan to move families as a unit. They will be registered at a reception center in the host jurisdiction and assigned to specific shelter during the evacuation period.

15. Security police are classified as essential workers in the high-risk areas. They will be evacuated with their families to near-in host jurisdictions and commute to work in the risk jurisdiction on a daily (two 12-hour shifts) basis.

16. In most host areas, fallout protection is inadequate to care for the resident population. The Defense Civil Preparedness Agency guidance requires development of plans to upgrade existing buildings by covering them with earth or to have individual families construct expedient shelter.

17. Under a contract with the Defense Civil Preparedness Agency, the U.S. Army Corps of Engineers has initiated a survey to identify buildings in each host area of Virginia that will be suitable for congregate care of evacuees. This survey will not be complete for several years. It is anticipated that all evacuees will be assigned to a designated shelter. However, it is not anticipated that more than 20 percent of this shelter will provide adequate fallout protection.

18. Population evacuation plans must be tailored to meet a specific requirement. A natural disaster evacuation plan is of little value as a nuclear alert evacuation plan. Our first priority for developing evacuation plans would focus on the natural or peacetime disaster requirement.

19. A. We believe that limited population relocation is feasible in a crisis situation if sufficient advance warning is given. We have serious doubts about the feasibility of relocating and caring for the large number of evacuees assigned in the national plan to the rural host jurisdictions of Virginia. Of particular concern is the large requirement for hasty development of adequate fallout protection in the host jurisdictions.

B. We believe that relocation within limits is a practical solution to increased population survival in the event of a nuclear war. The extent to which total evacuation of all designated risk areas is practical will not be known until surveys of host areas and host area plans are completed.

C. We believe the number of personnel to be evacuated over long distances needs to be reduced. This applies in particular to the northeast corridor from Massachusetts to Northern Virginia. We also believe it might be practical to construct, in advance, non-blast-proof, relatively cheap underground congregate care fallout shelters for a substantial percentage of the high-risk populations just outside of these areas. Similar structures might also be practical for construction in advance in host jurisdictions. Current Defense Civil Preparedness Agency plans call for the provision of fallout protection in host areas by covering first floors and roofs of homes and commercial buildings with up to two feet of dirt. Recovery from such an evacuation, even if there were no attack, would be more expensive than would the construction of near-in, underground fallout shelters.

20. Evacuation of principal population centers during nuclear alert, and the care of evacuees far in excess of the normal resident populations in rural host jurisdictions, will require skillful coordination of complex plans by the local government staffs. With proper emergency organization and training, we believe these local government staffs can get the job done. However, we believe it is essential that each of these local governments has a full-time, professional Coordinator of Emergency Services to participate in plans development, to coordinate local government staff training and plan maintenance, and to be available to coordinate implementation of these plans if required. At the present time, less than ten percent of the local jurisdictions have a full-time Emergency Services Coordinator.

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In most cases, this function is assigned as an additional duty to a Sheriff, a Fire Chief, or the County Administrator.

Sincerely,

GEORGE L. JONES.

DEPARTMENT OF EMERGENCY SERVICES,
Olympia, Wash., January 6, 1979.

Hon. WILLIAM PROXMIRE,
Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: Mr. George Rodericks, Director of the District of Columbia Office Emergency Preparedness, has advised this office through Mr. Hayden Haynes, President of the National Association of State Directors for Disaster Preparedness, that you are interested in receiving comments on your questionnaire regarding population evacuation if nuclear war threatens.

We have contacted the City of Spokane, a designated high risk area, where Crisis Relocation Planning is being conducted. Their responses are attached for your information.

Sincerely,

BETTY J. MCCLELLAND,
Director.
JOEL P. AGGERGAARD,
Coordinator, Nuclear Civil Protection.

Attachment.

COMMENTS ON QUESTIONS RELATING TO POPULATION EVACUATION OF METROPOLITAN AREAS

Jurisdiction, City of Spokane, Wash.; population: 200,000 (approximate), and Designation: High risk.

1. During the late 1950's, an evacuation plan was developed for use in the event of manned bomber attack. Population evacuation plan is currently being developed for evacuation when advance warning is received that nuclear attack may be imminent.

2. The plan is equally applicable, given sufficient advance warning.

3. The 1950's plan was partially tested by conducting a walk-out of the downtown area. Public cooperation was good and results were very positive. A test exercise for the new plan is programmed for Fall, 1979.

4. Department of Emergency Services.

5. Upon completion, plan will be reviewed every 2 years.

6. Direct federal, state and local coordination and assistance, with actual plan writing being conducted by a private planning firm under Defense Civil Preparedness Agency contract.

7. Local staff salaries; federally financed plan development.

8. Police—Law enforcement, traffic control, warning, communications. Fire Department—Fire prevention and suppression, light duty rescue, siren warning, decontamination. Public Works—Engineering, heavy rescue, traffic routing, decontamination, expedient shelter construction, damage assessment. Emergency Services—Direction and control, fallout shelter management. Transit, Finance, Health, Coroner, etc.—Assignments with their normal areas of responsibility.

9. Yes. Fallout protection, communication, operations areas, areas to house EOC staff. Not in daily use.

10. Yes.

11. Less than 150 miles, primarily using privately owned vehicles, supplemented by school and transit busses.

12. Approximately 54 hours. Two week stay in host areas.

13. Rerouting the normal flow of these commodities to the designated host areas.

14. These plans are still being developed.

15. During pre-attack relocation, police and fire personnel would be hosted in nearby host areas and commute into the risk area for 12-hour shifts, along with other essential workers in food processing and distribution and those in other essential areas.

16. Fallout protection in host areas is adequate for residents, but there is a shortage of about 60 percent of the hosted population for which expedient shelters would have to be constructed.

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17. Designated fallout shelter spaces exist in host areas for 40% of the relocated population.

18. The plan being developed has dual-purpose capability.

19. a. Yes, given adequate warning. b. Yes, and c. Yes, given adequate planning and warning.

STATE OF WISCONSIN, DEPARTMENT OF
LOCAL AFFAIRS AND DEVELOPMENT,
Madison, Wis., January 3, 1979.

Hon. WILLIAM PROXMIRE,
U.S. Senate,
Washington, D.C.

DEAR SENATOR PROXMIRE: The Wisconsin Division of Emergency Government appreciates the opportunity to respond to the questionnaire that was directed to the 20 largest cities including Milwaukee in Wisconsin. While the 20 questions are specific to the municipalities planning we would like to provide input from a state agency standpont in the development of this type of planning.

Recognizing that this is a fairly recent planning mission for this agency, we selected, two years ago, LaCrosse and Superior risk/host areas to do preliminary planning. We were able to get a resurvey for shelter, congregate care, reception centers, etc., for these risk/host conglomerates. Planning has almost been completed in these risk/host areas and indications are that the LaCrosse and Superior plan problems might be more simple than the problems that would accompany a Milwaukee plan, such as the dispersion of numerous firefighting and police services.

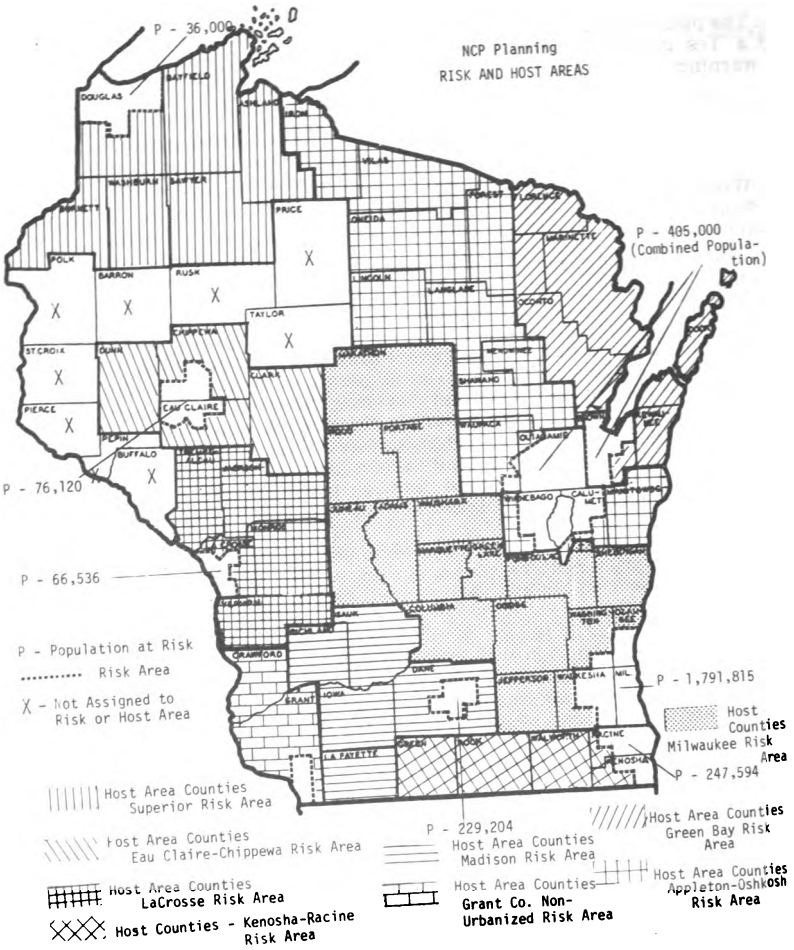
Until a resurvey of the host areas designated for Milwaukee for shelter, congregate care, reception centers, plus a system of food redistribution, etc., is completed it is unknown whether a satisfactory plan could be completed for such a large metropolitan area.

Preliminary planning indicates that relocation should be feasible for Madison, Eau Claire, Green Bay and Fox Valley's cities risk/host areas provided the logistical problems in your Question 13 are addressed. Service chiefs, police, fire, health, etc., of these various communities, both risk and host, have indicated that this type planning is necessary and feasible. We believe the resources of state and federal government must be increased so that additional shelter surveys, planning teams and other assistance to local government can be provided for the development of local plans for major metropolitan areas. For your information we are providing a copy of the risk/host areas that have been assigned to the counties of Wisconsin.

Sincerely,

MICHAEL P. EARLY,
Administrator.

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OFFICE OF CIVIL DEFENSE,
GOVERNMENT OF GUAM,
Agana, Guam, January 12, 1979.

Hon. WILLIAM PROXMIRE,
Chairman, Senate Committee on Banking, Housing, and Urban Affairs, Washington, D.C.

DEAR CONGRESSMAN: Reference to DC Office of Emergency Preparedness MSGS 919705Z and 202050Z, Dec. 78 RE: Hearings on Crisis Relocation Planning for January 8, 1979. The following information is hereby submitted in the hopes it will be of help to your committee. The numbered answers correspond to the numbered question in referenced messages cited:

1. Village evacuation to shelters upon condition II, by bus. Buses report to districts (Commissioners) for instructions where to start evacuating for both natural and nuclear disasters or to higher elevation for tidal wave, to preserve life.
2. Both.
3. Yes. Typhoon Rita was our most recent test, October 27, 1978. Successful.
4. Public Works Transportation Department.
5. Annually.
6. N/A.
7. Federal resources will be sought for printing expense.
8. Sheltering of the populace and restoration of the community.
9. Center should be operational in February 1979, and will be in daily use.
10. N/A.
11. One half to five miles within the villages. Transportation furnished are Government Buses and private owned vehicles will be used by many.
12. Villages 3–5 hours. Duration in shelters, 3–5 days.
13. Shelters have 3–5 day supply of food, water, and medicine.
14. To date we have had no reuniting separated unit problems, but if encountered the Chief Commissioner and Village Commissioners will be used.
15. Department of Public Safety Patrols.
16. Minimum.
17. 80 percent approximate.
18. Population relocation is covered under evacuation in both our plans, natural and nuclear.
19. A. Yes; B. Yes, and C. Yes.
20. Comments: For island evacuation the United States Air Force at Andersen Air Force Base, would have to be relied upon. Very few would leave by commercial flights or naval ship.

Respectfully,

PEDRO L. G. ROBERTO,
Acting Director.

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APPENDIX 3

TESTIMONY ON CIVIL DEFENSE

Prepared by

Henry W. Kendall
Professor of Physics
Massachusetts Institute of Technology
Cambridge, Massachusetts

Prepared in connection with Hearings, January 8, 1979
before the
Committee on Banking, Housing and Urban Affairs
U.S. Senate

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TESTIMONY ON CIVIL DEFENSE

A debate has been started concerning the wisdom of an enlarged U.S. civil defense program because President Carter and others in his Administration have proposed an upgrading and enhancement of this country's program, with a larger sustained dollar flow. Such a debate is not new. It is a conflict revisited, a continuation of arguments extensively set forth in the early 1960's, which ultimately resulted in the rejection of a larger program by the American public. But though the present controversy is not new, there are some changes in the arguments.

There are many levels at which a civil defense effort can be supported. Here, I wish to address the goal of developing, ultimately, a large civil defense effort, commensurate with or larger than the Soviet Union's, whose scope and design might alter the strategic balance between the United States and the Soviet Union or at least might be so perceived by Soviet planners.

The main points I make in this testimony are:

1) Such a civil defense effort necessarily must have as its centerpiece major evacuation of urban areas, possible coupled, in a much more extended program, with dispersion and perhaps hardening of industry.

2) The short-term effectiveness of a large program could fall anywhere in the range from relatively successful to wholly unsuccessful. In the period up to a few weeks after the nuclear exchange the effectiveness would be

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very dependent on how the nuclear exchange came about, how it was conducted, and how large it was. For example, an attacker could, in many circumstances, negate the short-term effectiveness of civil defense.

3) The long-term effectiveness of civil defense over months and years, and therefore the true practicality of enhancing the prospects for recovery, has to be gauged in terms of the expected or likely consequences of a major nuclear exchange. A large exchange would devastate the target nations so effectively that they would no longer function as modern industrial states. The residual capacities of this nation's industrial, agricultural, and economic systems would be unable to sustain more than a tiny fraction of the prewar population. A successful civil defense evacuation even after having great short-term effectiveness would grossly over-burden these very small residual capacities. In this circumstance the satisfactory survival and recovery of the handful who, in the best of cases, could survive, even at subsistence levels, would certainly be gravely prejudiced if not eliminated. Thus, the consequence of having a large

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civil defense program that provided effective urban evacuation and thus was a short-term success, would be to enhance the subsequent level of death and injury, and make even a vestigial recovery of an industrial nation a more remote possibility.

4) A national commitment to an expanding civil defense program will surely alter unfavorably the stability of the strategic balance. First, it will mistakenly suggest to increasing numbers of people in the U.S. that nuclear war, especially one of great scope, is winnable. This suggestion would be picked up and amplified in the Soviet Union. These events then in turn would generate greater pressures for expanded defensive and offensive systems in both countries.

In conclusion, then, the United States should not embark on any civil defense program which moves, or may threaten to move, toward a massive program because in the event of large scale nuclear war a program effective in the short run would, in all likelihood, aggravate the national injury in the longer run. Moreover it would, in the absence of conflict, surely foster the illusion that nuclear war is for participants a survivable event. And this would, in consequence, stimulate the nuclear arms race to greater vigor than it now has.

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PART II - CIVIL DEFENSE: SHORT TERM CONSEQUENCES

The numbers of nuclear weapons in the Soviet arsenal are so great as to induce destruction past all experience if used in significant part against the U.S. industrial infrastructure or, even worse, against the civilian population. There is no present prospect of mitigating these consequences once an exchange has begun. The Soviet Union could deliver thousands of megatons that would blanket the bulk of U.S. urban regions, even if directed against industries, with blast overpressures above 5 psi. The great thermal radiation loads and resulting fires, coupled with blast effects, would virtually guarantee that the country's urban areas would be totally flattened and, in considerable measure, burned out. Nuclear radiation levels from fallout, assuming ground bursts were employed, would be so high that practical fallout shelters would fail to provide protection, food and water over the period they would be needed. It is now understood that in the face of such effects a broad based fallout and blast shelter program in these areas is wholly unfeasible.

Thus, an effective civilian defense program must be based on flight and evacuation of the urban areas to rural parts. Even here many fallout shelters would be required for downwind of urban target areas radioactivity fallout at serious levels would extend 100-200 miles and in some cases more. In many parts of the United States urban areas are far more closely spaced than this.

In some special circumstances effective evacuation would reduce the prompt casualties from the attack, perhaps very substantially.

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Such circumstances might include:

1) A nuclear war which started slowly and in which, during a period of heightened tension, the evacuation could be largely completed.

2) A nuclear war of limited size in which one or a very small number of cities were struck.

3) A targeting strategy which was relatively benign; for instance a small number of ground bursts, minimizing radioactivity; not "following" the evacuation with nuclear strikes, and so forth.

Unfortunately, in many prospective kinds of nuclear war, the enemy might not be so accommodating nor might the circumstances of the war be relatively benign. Hence, the short range effectiveness of urban evacuation could be partially or wholly negated. Owing to the time required to complete nationwide a full evacuation, a time measured in days,and the resulting notice given to the attacker, several unfortunate things might occur:

1) The attacker retargets to destroy the civil defense support system; relocation areas, food and material stocks, and so forth.

2) Attacker strikes early, catching the evacuation en course. A very large increase in casualties would result.

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3) A civil defense program that had incorporated industrial hardening as a planned companion to evacuation could be expected to induce more ground burst weapons detonations to undo the effects of hardening, with an immensely amplified level of radioactive fallout.

4) And, of course, a limited nuclear war could well not remain limited. This possibility appears so large and is taken so seriously by very well informed people that worst-case planning almost has to assume escalation of a small nuclear exchange between the superpowers. Unfortunately, the supporting rationale for successful civil defense almost has to assume the opposite.

Thus, we conclude that while the short range consequences of an effective large scale urban evacuation might be great, there would be a very significant chance that the prospective gains would be lost. The long-term prospects are the next important issue.

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PART III - THE LONG-TERM CONSEQUENCES OF NUCLEAR WAR

In a nuclear war which included large scale attacks by the United States and Soviet Union on one another, one expects that the targeting, aside from weaponry devoted to military targets, would aim to disrupt the respective industrial systems of the combatant states. This has been the announced policy of the United States. If the Soviet Union should specifically target the U.S. population, the prospects for an effective U.S. civil defense, already dim as we shall see, would decrease even more. Hence we consider, conservatively, industrial targeting. Because industrial facilities are so often located in or near urban areas, these regions are subject to devastating injury.

A Soviet first strike could deliver over 8,000 megatons, carried by close to 5,000 warheads, to the United States. The United States could, after absorbing this blow, a significant part of it against military targets, conservatively respond with 1,000-2,000 megatons borne by some 3,000-4,000 nuclear warheads and nuclear bombs. Astute targeting by both sides would lead, among other things, to essentially complete destruction of the majority of those components of an industrial state which are critically important to its functioning. These are:

1) Key manufacturing industries such as ferrous and non-ferrous metal, transport systems and machinery, pumps and compressors, tools, forging and pressing equipment, and precision instruments.

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2) Energy: sources (coal mines, oil and natural gas fields, dams, etc.), transmission facilities (pipelines, tankers, and tanker ports), storage facilities (oil tank farms, gas storage, coal reserves), conversion facilities (nuclear, coal and oil, electric generating plants, refineries, etc.).

3) The transportation system: railroads and especially choke points in them, tunnels, bridges, airports, highways, ships and port facilities, canal locks, selected highways, loading and transhipping facilities.

4) The food system: selected agricultural and animal husbandry facilities, grain storage, food processing and storage, and so forth, much beyond the extensive damage to crop land consequent to radioactive fallout.

Recent Arms Control and Disarmament Agency studies have shown that in large-scale nuclear war, nearly two-thirds of U.S. "soft", largely non-military targets, and over three-quarters of the Soviet Union's, would be destroyed. These simple numbers conceal the full nature, extent, and consequences of the damage to the industrial infrastructure induced by the targeting strategy just outlined. With the critical elements of productive capacity, energy supplies, transportation and food taken out, with homes, other residences,

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medical facilities and hospitals largely gone, the capacity of the struck nations to provide for its survivors would become exceedingly small.

But the vast injury to the industrial infrastructure is not the whole story either. Surviving people would have to cope with a host of other war-induced obstacles, not just to their recovery but to their bare existence. These include:

1) A devastated environment, which might include climatic changes "of a very dramatic nature," could be induced by nitrogen oxides formed in the explosions, and particulates injected into the atmosphere from the several cubic miles of rock and soil vaporized in the blasts. Levels of ultraviolet could increase to an extent sufficient to cause lethal sunburn, eye damage and much increased skin cancer, and which could scorch crops and injure animals. And there would, of course, be declining but still significant levels of radioactivity over vast areas for extended periods. The health of peoples on a global scale would be affected. These effects might persist for years or decades.
2) Significant ecological imbalances from ultraviolet exposure, radioactivity and climatic change. Also genetic damage and mutations to many plants and organisms from the smallest

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to the largest. Some of these could be inimical to agriculture, animal husbandry, and fisheries.

3) The overwhelming and sudden physical destruction and disruption caused by the nuclear strike would be expected to induce deep psychic trauma among many of the survivors, leading to a marked incapacity to initiate and implement recovery activities as has been observed among survivors of great natural catastrophies. These effects could be coupled with a developing political unreliability and resistence, possibly extreme, to reimposition of civilian or military control.

4) The damage would be so extensive that little "outside" help for the survivors could be expected for very long periods, adding measurably to the problems of recovery.

Modern industrial nations depend for their functioning on interweaving and coordinating numerous technical, social, political, and economic activities. It is the integration of these activities that constitutes the national entity and makes it greater than the sum of its parts. As with a complex machine, a portion of a nation's parts must all work at least at some minimum level of efficiency, or the socioeconomic system ceases to function. A large

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nation is specially vulnerable to assaults that threaten its organized functioning. There is little doubt that a major nuclear strike poses such a peril. In my judgment there is little doubt that the target nations, in the aftermath of a major nuclear exchange, would no longer have national coherence, irrespective of who struck first, that they would be unhinged and dismembered to such an extent, socially as well as structurally, that even the regions and people that did not suffer direct damage could no longer function as modern industrial societies. Whether this damage could be remedied in a foreseeable future or would persist indefinitely, leaving the survivors as independent, scattered bands at no more than a survival level, is beyond confident prediction.

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PART IV - THE LONG-TERM CONSEQUENCES OF EFFECTIVE EVACUATION

Suppose, unlikely as this would appear, that relatively complete evacuation of a major part of the urban population of the United States (or the Soviet Union) were carried out prior to large scale strikes against military and industrial targets. Suppose also that the attacker did not, for some reason, blunt its effect by appropriate retargeting. Then the added tens of millions of urban refugees would have to be sustained by the ravaged, nearly non-existent and non-functioning remnants of the industrial and agricultural systems, a residue very likely not able to support the remaining rural population. Whatever residual capacity was left to the target nation to sustain survivors would surely swiftly decrease as emergency stocks of food and fuel dwindled and vanished and machinery stilled. The time available to a small number of survivors to readjust and recover, would not be available to the survivors with their number multiplied many fold. The plight of everyone would be much worse and the long-term prospects greatly prejudiced.

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PART V - CIVIL DEFENSE AND THE STRATEGIC BALANCE

As we have seen, the promise that a large civilian defense effort would be effective in the event of war would likely not materialize. The peacetime consequences of embarking on a growing civil defense program, centered on evacuation, can also be unfortunate. As noted, it can foster the illusion among those unaware of the slim chance of containing a limited nuclear war, of the full consequences of large scale nuclear war, and of the ineffectiveness of the program's mitigating damage, that preparing for such a war is a more acceptable matter than is in fact the case. U.S. commitment to such a program can stimulate such risky thinking, both in the United States and in the Soviet Union. Indeed, the moderately large, but practically ineffective, Soviet program is already having just this effect here. And the response has been to generate additional pressure for a comparable U.S. program as well as for new, offensive nuclear weapons systems. Clearly, then, a serious U.S. program would affect the strategic balance by undermining the stability of the standoff. To the extent that such a program is believed to provide "assurances" of survivability, it enhances the risk of escalation of events in time of stress. In any circumstance it encourages countermoves in the form of vigorous support for new U.S. weapons systems. These, with some few exceptions, cannot fail to affect injuriously the strategic balance.

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PART VI - SUMMARY AND CONCLUSIONS

No one can deny the humanitarian motive behind support for small scale civilian defense that would mitigate a very small scale nuclear attack or which might provide a framework for coping with regional disasters. But consideration of the extensive and immense consequences of major nuclear war, poorly understood and not infrequently omitted in arguments by proponents of civilian defense, and the consequent likelihood that civil defense would enhance rather than mitigate them, argues against a large program. Moreover, the unfortunate impact that such a program would have on the strategic balance, even in time of peace, bolsters this conclusion.

The broad view which we set forth here shows that the national security interests of the United States are consistent with, and indeed require, important limitations on the size and scale of civilian defense efforts.

Thus no program of augmentation should be initiated nor should a program which has the promise of becoming so.

Control of the nuclear arms race is among the most important and urgent of U.S. goals. Civilian defense on a large scale will not help achieve it. It should be given no support.

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A STATEMENT BY GILBERT J. LEONARD, PAST PRESIDENT, U.S. CIVIL DEFENSE COUNCIL TO THE BANKING, HOUSING, AND URBAN AFFAIRS COMMITTEE OF THE U.S. SENATE

Thank you, Mr. Chairman, for the privilege of submitting a statement to your committee on the subject of Civil Defense. I also appreciate being furnished a copy of the Committee's "Questions Relating to Population Evacuation of Metropolitan Areas" for my comments.

As has been said, I am a Past President of a number of State, Regional and national Civil Defense organizations and presently have the honor of serving as Chairman of Indiana Governor Otis Bowen's Advisory Council for Civil Defense. However, I do not present my views as an officer of any body but only as the Director of Civil Defense for my home political subdivisions, Terre Haute and Vigo County, Indiana; and from an environment of seventeen years of managing the emergency preparedness, response and recovery activities of my community of 115 thousand people.

First, let me make the general statement that, in my opinion, the most basic of all human rights is the right of the people, the citizenry, to be protected from Man's aggressions and nature's devastations by its government. If one accepts that statement as a human right for the people of this nation, then there is only one question to be answered in your hearings.

"Can American lives be saved by Civil Defense preparedness and specifically, by moving people from one area to another to avoid nuclear destruction?"

In my view, the answer to that question is very simple. History provides countless instances proving that Man's instinctive reaction to danger is to immediately flee from it. One needs only to look at news pictures and films to see people moving away from an obvious threat to their lives, such as hurricanes and warfare, by every means possible and as rapidly as they can. It seems very clear that any threat, beyond their control, causes most people to leave the danger area as soon as the threat is recognized . . . unless duty requires them to stay. All living creatures, if given the chance, will do the same. Since life on this planet has endured, flight from danger . . . evacuation, if you will . . . seems to work. The conclusion has to be that if it is bound to happen in any case, it is better that flight from danger be undertaken in a planned and orderly manner with some provisions for the care of the people at the other end of the journey.

I think all of us can agree that federal consideration of Civil Defense or attack preparedness, might not be necessary at all if every nation outlawed the possession of weapons having the magnitude of the nuclear bomb along with the ability to deliver a number of them quickly and efficiently on a target thousands of miles away. However, as long as such weapons and delivery systems do exist, it seems prudent that all nations must take them into account and prepare their people against their use by an opposing nation or international brigands.

There are also those who profess to believe that there would be much less world-wide concern if the nuclear nations were either not able or were not interested in protecting the lives of their citizenry from the same weapons aimed their way as is postulated by the theory of Mutual Assured Destruction (MAD). However, most informed and professional persons have been reporting for some time that Russia pays no attention to this discredited notion and has spent billions of dollars on Civil Defense processes to protect their people . . . creating blast shelters, fallout shelters and evacuation plans; not to mention important industrial and economic measures.

There are, of course, a few highly placed persons who belittle the reports of Russian nuclear preparedness and suggest that we should ignore their significance. There are also a few Civil Defense "old-timers" who negatively complain about past planning errors and refuse to think positively about new measures. The problem I have, Mr. Chairman, is that I observe those who plead for a reasonably competent Civil Defense program for the United States almost always do so with documented facts, intelligence studies and historical data while those who oppose even moderate Civil Defense measures usually have little or no corroborating evidence other than a personal opinion and a fervent desire for peace.

Mr. Chairman, I also pray for peace but I am not so naive that I can forget the events of history caused by Man's pugnacious character and natures destruction. I must say to you that while the people of this country rarely challenge unsupported opinions of prominent people and much governmental nonsense and

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seldom complain about a lack of attention to their needs and wishes, when the chips are down and push comes to shove, they expect results, not rhetoric. They will not tolerate excuses and are cruelly unforgiving for what they view as dereliction of duty.

My personal judgment of all the past and the newly proposed Civil Defense measures, and the view commonly held by most of my colleagues, is that we simply do not know if fallout shelters and crisis evacuation would survive most of the people from a nuclear attack even if all such countermeasures were carried out in an orderly and well planned manner. But what must be taken into account, Mr. Chairman, is that it is far better to have an imperfect plan which can be improved from time to time than to have no plan at all. At the same time, we must also keep in mind that no plan can ever guarantee 100 percent survival from any disaster. There is no such thing as perfect.

Mr. Chairman, surely you are aware that every public poll indicates that the American people believe that the federal government should provide them with an excellent emergency preparedness plan and every possible protective device for their safe keeping from Man and nature . . . and think that the government is already doing so. We also know that the American people forgive very easily and often make mistakes of the heart but they are not foolish and they know that survival from a holocaust of any kind requires planning and preparedness before the event and not after.

Mr. Chairman, it is painfully evident that those who criticize any proposal to upgrade the Civil Defense programs and object bitterly to the specific plan to combine public fallout shelters with public crisis relocation plans, have no alternative plans or substitute defensive programs of their own for the people. Oh yes, they do say that all nations should agree to peace covenants and that they should do away with nuclear weapons. Those of us who deal with disasters and emergencies every day think that the proponents of such idealism confuse wishful thinking with reality and view the world as they think it ought be rather than as it really is.

Mr. Chairman, until the day when all the peoples of the world actually do put aside their historical urge to dominate their fellowman and impose their will upon him by force, it is unthinkable for the Congress and the President to expose our people, our government, our way of life to the vagaries and caprices of other nation's leaders and international intrigue. It seems perfectly reasonable to local government that the citizens of the most compassionate nation in the world should be entitled to the very best insurance for themselves and their children's survival from disaster . . . in short, the very best defenses against man caused and natural catastrophes our leaders can devise.

Mr. Chairman, the decision to bring into being the best possible civil preparedness program for the people of this country is long overdue. It should not be debated any longer. It should be accomplished as soon as possible. Let's stop talking about it. Let's stop questioning whether we have a perfect plan right now or not. Let's get on with getting the job started. That is the American way.

Thank you for the opportunity to share my views with you.

AMERICAN CIVIL DEFENSE ASSOCIATION,
Gainesville, Fla., January 26, 1979.

Senator WILLIAM PROXMIRE,
Chairman, Committee on Banking, Housing and Urban Affairs
U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: Submitted herewith is a Statement of the American Civil Defense Association which we respectfully request be included in the record of the hearings on civil defense conducted this month by the Committee on Banking, Housing and Urban Affairs.

The Statement points out that the analysis of the Arms Control and Disarmament Agency admits that as many as 100 million more Americans than Russians could die in the first missile exchange in a nuclear war. It is the position of the Association that this state of affairs represents an extreme failure of government.

The Association believes that the time has come to undertake significant civil defense measures, including a shelter construction program, without further delay.

Very truly yours,

ROBERT A. LEVETOWN,
Washington, D.C.

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Frank Williams, Florida House of Representatives, Bradford County Civil Defense Director, 1963–1974, writer.

G. William Whitehurst, U.S. Congress, Member, House of Representatives Armed Services Committee, writer, educator.

STATEMENT OF AMERICAN CIVIL DEFENSE ASSOCIATION, BEFORE THE COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS OF THE U.S. SENATE

I. INTRODUCTION

The American public is Constitutional guaranteed a civil defense system that is capable of maximizing the number of lives to be saved in the event of a nuclear disaster. Civil defense expenditures have represented less than 0.1% of the Federal budget. Because this level of expenditure could only finance inadequate and half-way measures, the final result has been that, cumulatively, hundreds of millions of dollars have been spent on civil defense over nearly a thirty year period and yet the plans and facilities currently in existence will save comparatively few lives in a nuclear emergency. This represents an extreme failure of government in an area critical to national survival.

II. THE POSITION OF THE ASSOCIATION

The Association believes that an effective civil defense must include an extensive shelter capability. Community blast shelters should be built where large numbers of people congregate in high risk areas: in major shopping centers; in large schools; and in major governmental, commercial and residential buildings. An evacuational and fallout sheltering capability should also be developed, not over a seven-year period as DCPA proposes, but within the next two years.

1. The legal entitlement of the public

The Constitution obligates the federal government to "provide for the common defense." The Federal Civil Defense Act of 1950 specifically states that "it is the policy and intent of Congress to provide a system of civil defense for the protection of life and property in the United States from attack." In complete contempt of these legal requirements, the federal government has utterly failed to take any effective steps to protect the lives of citizens other than high government officials from the effects of nuclear warfare. If it were to be suggested now that such a flagrant disregard of official responsibility could be the basis for impeachment, the suggestion would no doubt provoke only smiles. After the first nuclear disaster occurs, however, and thousands, if not millions of Americans become casualties, the smiling will cease.

2. The nature of the threats we face

Those persons who would encourage the federal government to continue to ignore its civil defense responsiblities prefer to focus on the most challenging survival situation—an all-out nuclear war in which the United States is a participant—and to ignore other potential threats which would be more manageable.

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Arguing from this posture, they then assert that no civil defense measures can be shown to guarantee the long-term survival of the great majority of Americans and, therefore, no significant civil defense effort should be undertaken.

The Association disagrees with this approach for the following reasons:

a. There are a variety of situations in which nuclear explosions or radioactive contamination can threaten the lives of the American public. These include atomic bombs in the hands of terrorists, civilian and military nuclear accidents, "limited" nuclear war, and nuclear war between other nations. The State Department, for example had noted that the fighting in Cambodia between Russian and Chinese clients threatens a "wider war" and the Chinese have reinforced their troops on the Russian border. If a major armed conflict should eventually erupt between the Russians and Chinese, nuclear weapons could well be employed. Americans, in turn, would be affected by the resulting radioactive contamination from such a conflict. The American public is not prepared to protect itself even against such low level radiation only because its elected and public officials have failed to discharge their legal responsibilities.

b. While it is true that an all-out nuclear attack upon the United States would be an environmental disaster of uncertain proportions, it is also true that, even under these extreme conditions, many millions of lives could be saved by careful preparations and an extensive shelter system. There are those, of course, who claim that the post-attack environment will be so hostile that even sheltered populations, well-supplied with food, water and medicine, and effectively led by persons adequately trained for the recovery effort, could not possibly restore conditions to permit long-term survival. The burden of proving this proposition, however, should be placed upon those who advance it. Unless it is proven beyond any reasonable doubt, civil defense preparations to save lives in the event of nuclear war should proceed apace.

3. The cost of shelter construction

It has been estimated by DCPA that a first-class shelter system would involve a one-time cost of approximately $60 billion.[1] The DCPA has concluded that this cost is "politically unacceptable" and, therefore, does not propose to build shelters. The Association believes that what is truly unacceptable is for the taxpayers to continue to spend $100 million every year to support a civil defense program that has produced so few tangible results for more than a quarter of a century.

The cost of a shelter system is not extraordinarily high when compared, for instance, to the cost of developing the MX missile and its various basing modes. Nor will the shelter program involve as many technological unknowns and opportunities for cost overruns. Finally, a shelter program could create employment for many ordinary working people, and many of the shelters so constructed could be assigned peace-time dual uses.

4. Civil Defense as a social program

The federal government spends billions of dollars every year to improve living conditions for the disadvantaged. If this is a worthwhile expenditure, it is obvious that a similar serious commitment should be made to improve the chances for survival of these very same disadvantaged citizens.

There can be no doubt that the poor would suffer disproportionately in a nuclear catastrophe in the absence of government planning. It is the poor who live in the center of urban congestion. It is the poor who lack the transportation and resources for the type of spontaneous private evacuation which took place during the Cuban missile crisis. Given some modest lead time, people with spare cash, a good stock of canned goods, and a place in the country can greatly improve their chances for survival. The poor need some form of organized government assistance to be placed on a comparable basis.

Recently, various proposals for welfare reform have been publicized which are said to cost, annually, $6 billion to $36 billion more than the current program. Compared to these figures, a $60 billion one-time cost for an effective shelter system for the entire nation seems very reasonable.

[1] This one-time cost would not and could not, as a practical matter, be expended all in 1 year. If the program were completed over a 5-year period, the average annual cost per citizen during that period would be less than $60. This represents a very cheap form of life insurance.

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5. The evacuation option

Under certain circumstances, and particularly where the Soviets order the evacuation of their urban populations, it would be very desirable to have the option of relocating Americans who live in high-risk target areas. Over a period of time, as the Soviets continue to add to the many thousands blast shelters they have already constructed, the time-consuming evacuation strategy will become less important to both sides because most Soviet citizens will be able to protect themselves in a matter of hours in their blast-resistant bunkers.

The DCPA has proposed to develop an evacuation capability for this country on a timetable that will assure its obsolescence before it is ever effective. Officially, the DCPA asserts that its evacuation plan could be "in place" after seven years. Mr. Tirana, however, has been quoted in Aviation Week and Space Technology as stating that he viewed the plan "as more viable for use 10–15 years from now." (November 10, 1978).

If we want to have an evacuation option that will be useful, it must be developed quickly. It may cost more to develop the system in two years rather than in seven or more years, but a rapidly developed plan will be worth a great deal to this country whereas a leisurely developed plan will not.

III. POSITION OF THE ARMS CONTROL AGENCY AND MR. WARNKE

Mr. Warnke has advised against a serious civil defense effort on the theory that we have the retaliatory capacity to destroy Russian society so totally that the Soviets would not dare attack us with nuclear weapons. Mr. Warnke relies, in his connection, on an analysis prepared by the Arms Control and Disarmament Agency which he led until recently.

The Agency's study, however, shows that even if we were fortunate enough to have our forces on alert before a Soviet first strike (thereby maximizing the survival of our strategic bombers and submarine force), the Soviet Union, through a combination of urban evacuation and blast shelters, could suffer as few as 23 million fatalities from our retaliatory strike.[2] These fatalities represent roughly 10 percent of the Soviet population, approximately the percentage of fatalities the Russians suffered in World War II.[3]

The analysis of the Arms Control Agency also demonstrates how the very policies that it has advocated in the past have resulted in a situation where many more Americans than Russians will be killed in a nuclear war. The Agency has advised against the development of the U.S. strategic weapons that might have a first-strike capacity; it has preferred launch vehicles such as bombers and cruise missiles that take many hours to reach their targets and are thus not suited to a preemptive attack. It has also counseled against the development of heavy ICBMs that might be used to destroy hardened enemy missile sites. The Russians, however, uninhibited by an arms control bureaucracy of their own, have deployed an arsenal of heavy ICBMs capable of a surprise attack and suitable for the creation of an enormous amount of fallout.

Because the Soviets have seized these advantages, the Arms Control Agency now advises the public that, even if we were to evacuate our cities to match a Russian evacuation, our fatalities in a nuclear exchange would be roughly two or three times as great and approximately 50 million more Americans than Russians would die. (See ACDA's An Analysis of Civil Defense In Nuclear War, figure 13 at p. 11).

[2] The agency claims that the number of Soviet fatalities could be higher if we targeted the Russian population instead of the military and industrial targets that we presently plan to strike in retaliation. In turn, however, American fatalities would also be higher if that were the Russians' targeting strategy. The Agency's study does not even attempt to quantify the number of immediate American fatalities that would occur if the United States continues to have no effective civil defense and the Soviets were to attempt to maximize our civilian casualties.

[3] According to the Soviets, World War II destroyed 1,700 of their cities, 70,000 villages, 32,000 industrial enterprises, 98,000 collective farms, 1,800 state farms, 17 million head of cattle, 84,000 schools and most of their bridges, hospitals and libraries. (Dmytryshyn, U.S.S.R.: A Concise History, 3d ed., 1978, at pp. 231–32). Despite this devastation, the Russians recovered to become a world power of the first rank within less than a decade.

When the American public was originally sold on the concept of "assured destruction," they were told that the concept was "predicated on the ability to destroy one-fourth to one-third of the Soviet population." U.S. House of Rep., 95th Cong. 2d sess., Hearings, Military Posture and H.R. 10929, Committee on Armed Services, H.A.S.C. No. 95–56, part 1 of 7 parts, p. 485. Authoritative sources other than the Arms Control and Disarmament Agency have estimated that the Russian civil defense program will allow the Soviets to ride out a retaliatory strike with a fatality rate far less than 10 percent.

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Mr. Warnke, the former head of the Arms Control Agency, makes no apology for having contributed to placing the American public in this disproportionately vulnerable position. Instead, Mr. Warnke proposes in all seriousness that. even now, no significant civil defense effort be undertaken in this country—a policy which would further multiply the number of American dead relative to Russian fatalities. His former Agency's figures show that if we continue to have no effective civil defense and the Russians continue to pursue their program of shelter construction and evacuation planning, the ratio of American fatalities to Russian fatalities could climb from two to three times as high to four or five times as high and the absolute number of additional American deaths over Russian deaths could climb from roughly 50 million to the neighborhood of 100 million.[4]

Mr. Warnke airily dismisses the staggering implications of this data with the comment that it is "meaningless to speculate about possible discrepancies in relative fatalities." In fact, as Mr. Warnke made clear over and over again, he was not addressing himself to the question whether a serious civil defense program could save millions of American lives. In the Association's view, however, that is the question which must be addressed.

Conclusion

The Association believes that our civil defense program must concentrate on saving American lives. It is no answer to the many millions of people who could be saved to argue that many others, in any event, will perish.

It is a national disgrace that government officials continue to countenance policies which, by their own admission, may produce approximately 100 million more fatalities in America than in Russia in the event of a nuclear war. This lack of official responsibility is heightened by the fact that Congress has already enacted legislation declaring it to be national policy to take the steps necessary to safeguard American lives in the event of a nuclear attack.

While the cost for a serious civil defense program would be significant, it is no more significant than the cost of today's highly sophisticated weapons systems which are more vulnerable to technological obsolescense and Soviet countermeasures than a well-planned shelter and evacuation system would be. Our nation needs a greatly enhanced civil defense now, not seven to ten years from now, and a start should be made immediately.

Yale University,
Department of Political Science,
New Haven, Conn., February 7, 1979.

Ms. Martha Braddock,
Professional Staff Member, Senate Banking Committee, 5300 Dirksen Senate Office Building, Washington, D.C.

Dear Ms. Braddock: It is astonishing and disconcerting to find responsible members of the Carter administration, and of the Senate, advocating heavier outlays to civil defense, particularly when the central concept underlying civil defense thinking is that of evacuation.

More than twenty years ago, when I was on the faculty of Michigan State University, I participated in a FCDA-sponsored national study of local civil defense in thhe United States. This was an era when civil defense doctrine was

[4] It cannot be ascertained whether even these enormous disparaties in relative fatalities are understated since the basis of the agency's study concerning weapons effects is classified.

Among other things, the study does not indicate whether it has taken into account the additional American fatalities that would be suffered from the atomic weapons that could be delivered by the Soviets' Backfire bombers which, at their present rate of production, could increase the Soviets' deliverable megatonnage by 25 percent to 30 percent by 1985; nor does the study indicate whether it has taken into account the destructive potential of the Soviets' SS–20 mobile missiles which, reportedly, can easily and quickly be given an intercontinental range. *See,* Report, Panel on SALT of the Intelligence and Military Application of Nuclear Energy Subcommittee of the Committee on Armed Services, U.S. House of Rep., 95th Cong. 2d sess., H.A.S.C. No. 95–95, pp. 11–12.

The Agency's study is said to be based on a mid 1980's time period and the assumption that SALT II will have been ratified. It is similar in its time frame and findings to another Agency study, release in August, 1978, entitled "U.S. and Soviet Strategic Capability Through the Mid-1980's: A Comparative Analysis." The latter study has been criticized by a panel of a Congressional subcommittee as having been "based upon a number of erroneous assumptions" and for presenting "a distorted, inaccurate and misleading picture of United States-Soviet strategic capabilities." Report, *supra,* p. 20.

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laboriously shifting from "evacuation" to "shelter." Many of the issues now being debated at Washington were explored in depth and exhaustively reported on by the research team.

My colleagues and I were asked by FCDA to provide answers to several questions, including the following:

1. What mode of civil defense was most effective and feasible for the United States?
2. What factors accounted for varying levels of civil defense effectiveness in our cities?
3. Where in the government should the civil defense function be located, and how should it be administered?

Our research strategy included a lengthy questionnaire that was mailed to a number of officials and opinion leaders in this nation's "target cities," as then designated by the Department of Defense. In addition, we conducted in-depth interviews in several cities that ranged from very good to very bad local civil defense organization, as defined by FCDA. We wound up with several hundred usable questionnaires and interview protocols. All of these data were meticulously coded, run through the computers and then analyzed by the research team. Our report to FCDA consisted of a fifty-odd page summary, plus the report itself which ran to over 1,000 pages. Partly, I think, because the report recommended the dismantling of FCDA as it was then constituted, and contained a wide range of criticisms of civil defense doctrine and practice, it was never published.

Among the major conclusions we drew, the following may be of interest to you:

1. That the concept of evacuation was fundamentally wrong—in the technical and logistical, as well as the social, political and moral sense. If the last two decades have removed the technical and logistical objections to evacuation, that can be true only at the margins. The demographic patterns of the United States since the mid 1950's have, on the whole, made our basic objections to evacuation even stronger today than they were then.
2. The concept of shelter then prevailing (i.e., Americans scurrying about following Smyth's advice about cheap shelters in the backyard or basement) was equally fallacious. Shelter was, and remains, the only realistic device for saving lives in the event of nuclear war, but this means deep shelter at an outlay that would run into billions of dollars.
3. If civil defense is an essential element in our strategic planning, it is too important a function to entrust to the kinds of persons (at Washington and in the states and cities) involved with its administration. We recommended that the function be administratively integrated into the DOD.

I am moved to pass this along because of your forthright opposition to proposals to add $100 million or so to the civil defense budget. Such an allocation would be more than wasteful. It would represent (however well intended) cruel and cynical treatment of the American public. And if there is anyone around naive enough to think the Russians will miss the emptiness of the gesture, I really fear for the quality of defense planning in our nation.

Perhaps you can strike a blow for rationality by suggesting that those who favor evacuation take a look at a report, prepared at some expense to the federal government, which is still available for perusal.

Respectfully yours,

JOSEPH LAPALOMBARA.

CORNELL UNIVERSITY,
CENTER FOR INTERNATIONAL STUDIES,
Ithaca, N.Y., January 11, 1979.

Senator WILLIAM PROXMIRE,
Senate Banking Committee,
Senate Office Building, Washington, D.C.

DEAR SENATOR PROXMIRE: The New York Times of January 9, 1979 carried the report of the one day Hearing on Civil Defense.

In the case that you may be seeking supplementary material to include along with the testimony in a Hearing volume, I enclose a paper that I did on the subject some years ago. It is however still relevent because it concerns precisely those aspects of a post-thermonuclear attack environment not usually addressed

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by discussions and studies of civil defense, the longer term derangement that would result from massive attack to any integrated economic, industrial and social system.

Some other more recent studies which may be of interest to you or your staff for the same purpose are:

(1) Congressman Les Aspin's study of December 26, 1978.

(2) U.S. Department of State, Special Report No. 47, September 1978, "Soviet Civil Defense."

(3) The CIA report, "Soviet Civil Defense," July 1978, NI 78-10003.

(4) F. M. Kaplan, "Soviet Civil Defense, Some Myths in the Western Debate," Survival, Vol. 20, No. 3, May-June 1978, pp. 113-120.

(5) W. H. Kincade, Repeating History: The Civil Defense Debate Renewed International Security, Vol. 2, No. 3, Winter 1978, pp. 99-120.

For the most part these all deal with the major immediate aspects usually discussed within the civil defense debate.

I presume that a Hearing volume will be prepared, and I should like to request a copy of it when it appears. If that is not planned, may I ask if the committee has copies of the testimony that was prepared for presentation to it that might presently be available.

These would be of much use to our work.

Sincerely yours,

MILTON LEITENBERG.

SOUVENIR PRESS,
London, England, 1969

IMPLICATIONS OF ANTIBALLISTIC MISSILE SYSTEMS—PUGWASH MONOGRAPH II

(Edited by C. F. Barnaby and A. Boserup)

(By M. Leitenberg)

I: CIVIL DEFENCE PROGRAMMES; RESEARCH IN THE UNITED STATES CONCERNING THE POST-ATTACK ENVIRONMENT

In earlier discussions of active ballistic missile defense (1960-5), passive defence measures such as fall-out shelters and shelters for protection against the effects of blast and heat were also discussed. There has been a hiatus in the discussion concerning merits, demerits or procurement of these facilities, but not in ongoing research that would be necessary to indicate the requirements of such systems and to support their procurement should the question be reopened. In the 1965-8 period, there has been little or no mention of Civil Defense (CD) in the discussions in the United States of the "thin" or "thick" ABM system, or in those which surrounded the procurement of the Sentinel ABM system. The following short item appears in the 1969 United States Department of Defense appropriation hearings:

> *Question 62.* The testimony states with respect to both Postures A and B defenses against a Soviet nuclear attack, "we would also want to expand and accelerate the fallout shelter programme".
>
> Why is this sentence left out of the unclassified testimony?
>
> Answer. In moving from the classified to the unclassified version of the statement, the phrase referred to was dropped for editorial reasons. The point that an expansion of the civil defence effort would be an integral part of any large Damage Limiting program has been made frequently in prior years and could just as well have been included in the unclassified version of this year's statement. [1]

In the Senate Committee on Foreign Relations, Subcommittee on Disarmament, Dr. J. S. Foster was asked:

> Tell us something of the magnitude and cost of a shelter program to defend the major cities in the United States.
>
> Answer. The civil defence program we are now pursuing is estimated to cost around $800 million in the period fiscal year 1968-fiscal year 1972. This will provide, with what has gone before, about 230 million shelter spaces. An expanded fallout shelter program to accompany an austere NIKE X deployment would cost about $800 million additional and add a total of about 50 million fallout shelter spaces by the end of fiscal year 1972.
>
> (Note: depending on the assumed time of an attack, the population will be distributed differently, so that there is not a one-to-one correspondence between shelters and population.)

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When civil defence advocates presented for national approval their programmes for both fall-out and urban blast shelters in 1960–1, these proposals ran headlong into overwhelming difficulties and opposition, in both the technical and political arenas. There are very strong feelings among civil defence advocates today not to repeat the same technical and political "mistakes" the "next time". What this determination means functionally is hard to say. There will always be a certain category of items raising uncertainties concerning post-attack human behaviour. These will never be entirely removed no matter what the level of technical development and certainty engineered into the physical aspects of the shelter system. Barring an infinite expenditure and an entire move underground by the strategic powers—of cities, food production and storage facilities, power production, etc., newer strategic delivery systems will continue to attempt to undo any savings derived from the installation of passive (or active) defensive systems. Questions relating to the degree to which a large CD programme would exacerbate the strategic confrontation it ostensibly is attempting to protect the nation from, would always remain. Finally, it is difficult to foresee the criteria that CD advocates anticipate that would alter the present widely assumed United States congressional opposition to a large-scale blast shelter programme.

Because of the mention made in Chapter I to the United States Office of Civil Defense budget for 1969 it is relevant to Office of Civil Defense (OCD) expenditures for previous years and, therefore, these are given in an appendix to this chapter. Also included are remarks relevant to CD which appeared in the most recent statement of United States Department of Defense witnesses before Congress, and rather than intrude these here, have again placed them in an appendix. One can simply summarize these remarks by saying that a rather extensive United States national fall-out shelter programme continues, hoping by the end of 1968 to have identified 170 million spaces, to have marked 101 million, and to have stocked 55 million with an average of 14 days' supplies.

All of the subsequent discussion of Civil Defense will be in terms of research on the post-attack environment. In January to May 1967 the author had an opportunity to read or look at some unclassified reports on aspects of civil defence. Their source and number follow.

	Number of reports
1. Rand Corp	33
2. Hudson Institute	42
3. Oak Ridge National Laboratory; civil defense research project	18
4. Office of Civil Defense	5
5. Stanford Research Institute	22
6. National Academy of Science—National Research Council	20
7. Miscellaneous (about)	12

This is an unknown, and probably small, fraction of the total of such reports. Civil Defence related research, for specific shelter "hardware" items as well as for systems analysis, is funded by the Advanced Research Projects Agency (Department of Defense) (ARPA), the Defence Atomic Support Agency (DASA), the Office of Emergency Planning (OEP), the Atomic Energy Commission (AEC), the U.S. Air Force, the U.S. Army and probably by other agencies, as well as by the Office of Civil Defense. Many other smaller private research corporations in addition to those listed above have such contracts: IIT Research Institute, Research Triangle Institute, Betelle Memorial Institute for Research, Human Sciences Research Inc., Planning Research Corp. Research is also undertaken by many individual researchers in universities. Some also is carried out in various government departments (Agriculture, Health, Education and Welfare), and by the military services themselves (U.S. Navy and Air Force). At the very least one has to say that there is a great amount of CD related research going on in the United States, though the sums of money involved are very small in relation to most other United States defence related expenditures. Nevertheless, the listing of other agencies that fund such research indicates that it is insufficient to look at th OCD funding alone in attempting to form a correct estimate of the expenditure in this area.

Whether *any* amount of research is capable of "solving" the problems of a potential post-thermonuclear exchange environment is another question.

How good are the above reports? Some are so inept, and so obviously transfer standard peacetime methods of thinking to the most extraordinary non-peacetime situation imaginable, as to be meaningless. Some make attempts to be thorough

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and rigorous. However, most of the latter concern material supplies. For example, one set of documents which was found somewhat impressive, probably because they tell more about the complexity of the pre-attack economy than they do about the potential of post-attack recovery, is a group of over fifty technical reports and 187 technical manuals prepared by the National Planning Association for the National Resource Evaluation Centre (NREC) of the Office of Emergency Planning (OEP). These all concern computer programmes containing stored data on various damage assessment programmes, manpower and economic resource surveys, and PARM (Programme Analysis for Resource Management), concerning administrative criteria and goals in the post-attack situation. Here for example one will find pages of material on "Footwear, excluding Rubber", with estimates of how much would be contaminated and usable, moderately damaged and usable, contaminated and lightly damaged and usable, etc., and estimates of time and resources needed to reinitiate production. In fact, if one needs information on the national resource base, to know what is and what can be made in peacetime, one would go about it as is done. However, the PARM Project Final Report states in its introduction:

> These production schedules are limited by the surviving stock of products and producing plants. About 300 industries are considered separately. If capacity is short in any industry, added capacity is created as required, by decontamination, damage repair, or new construction. Such additions to capacity are, of course, scheduled only after allowing time to perform the needed construction work. Production is also limited by surviving effective manpower of each industry, plus additional manpower which could be trained. In some cases, substitution of one material or product for another is scheduled in order to break a bottleneck.

And now one has the obvious questions: How much decontamination equipment will remain? Will its distribution be random in relation to need? How much will losses in personnel trained to carry out the decontamination procedure affect utility of surviving equipment? With what materials will you repair damage and build new construction? Will such material be deliverable, or will delivery routes and means and energy sources for delivery vehicles be interdicted. Most critically, what one wants to have is an understanding of the "deficit interactions" that a series of degraded and interacting industrial elements would have on each other, i.e. to what degree does the degradation in a chain have a spreading or "snowballing" effect: power, parts for power generation, fuel for power generation, parts for transport, fuel for transport, transport for fuel, road and railbed for transport, parts for production machinery, degradation of all the "parts" production industries; metal and alloy supplies for machinery and parts production, etc. (In some areas, such as communications, hardening of facilities has quietly proceeded to some degree as part of present CD or other federal programmes.) Those who formulated the PARM models are aware of these obvious questions (though at times such awareness seems to be absent in the phrasing of many other studies, despite the obviousness of the questions), and there has been an attempt to answer them by an input-output matrix of 190 units, based on the 1947 data of the Bureau of Labor Statistics. The criticisms that one has of this attempt can be basically separated into two groups. One has the conceptualization for a very sophisticated evaluative technique, with a very poor data base:

(*a*) The input data is too old.

(*b*) The matrixes and the data they contain are too broad, as they are by industry, or even by groups of industries. One simply needs enormously greater detail: i.e. within a particular industry are there certain critical elements; a particular solvent, lubricant, alloy or bearing, and how wide then is its production and disribution base?

(*c*) The post-attack postulated deficits are in terms if a percent loss to the industry. This may again be not specific or particular enough to work from in designing reconstruction programmes.

(*d*) Geographical-regional data seems weak and also not detailed enough.

(*e*) Authoritative economists have informed the author that as detailed before-the-event central planning as is here required is impossible even in peacetime, at any rate at present, because not nearly enough is known about the techniques of production, the way they change, and their interdependence, it is therefore not now used even for peacetime economic planning, and there is no *a priori* reason to suspect that it would function any more satisfactorily in a wartime or post-attack world. In addition there are even questions from within the economic pro-

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fession as to whether linear programming is suitable for industrial modelling, since economic techniques of production are not ordinarily linear. In economics, the field of the social sciences in which measurement has gone furthest, any predictions other than the short-term predictions of the movements of a known system have a very bad record. This is, of course, said in the preface to economic reports, but it is not said loudly enough—and it soon becomes easy for people to believe that they really know what is likely to happen. The tendency to indulge in abstract and unsupported postulations in United States strategic analysis is bad enough as is, with strong precedents in the political mood and context in which such analysis occurs, as well as in the methodolgy of several of its leading practitioners, and it would seem to be desirable that it receives as little further unsubstantiated input as possible.

To take another smaller example, in a paper on "Grain Stocks and Protein Supplies" in the ORNL Annual Progress Report (1966–7) of its Civil Defense Research Group, there is a section on Soybean Production and Vulnerability of Processing Mills. The author makes a relatively happy discovery that on tallying United States soybean production by counties with the 9000-megaton mixed military industrial-population nuclear attack on the United States postulated in the book *Strategy for Survival* by Martin and Latham, 87 percent of the soybean processing mills would survive, and hence be able to continue production. He discusses the feasibility of simple grinding methods that would re-route soybean flour for use in direct human consumption, the very low cost of presently importable machinery for this purpose, and the desirability of placing three such sets of machines in each present factory. The "87 percent" figure of remaining mills is allowed to stand as a general indcation of a post-attack soybean processing production capacity. How meaningful is this? No data is given in the power needs of such plants, their present sources, and the survivability of such generating systems and transmissions lines under the same Martin and Latham grid. Solvent storage at soybean mills is presently kept to a minimum, due to danger of its high inflammability (probably n-heptane, a petroleum distillation product). No data is given on refinery survival, on barrel or railroad tank-car survival which would be as necessary for the delivery of solvent as for the distribution of the finished product. In this case it was recommended that the soy flours be mixed with other grain flours for nutritional reasons. This assumes a like series of assurance—or questions—for the milling sequences of the other grains. Finally, how much present soybean land would be uncontaminated? how much seed would survive? and many other questions at the farming end—since soybeans are tractor cultivated and harvested, and would require fuel for tractors, etc. In short, when looking at the degradation in any one item, industry or capacty, these studies often or usually tend to ignore deficits in all the other interacting items, industries and capacities, and invariably come up with an optimistic result. Workers in this field of research have been heartened now that it is possible to introduce into their calculations reductions in damage estimates predicted by active (ABM) as well as passive (CD) ballistic missile defence systems.

In summary these criticisms imply, that despite the appropriateness of the general method of analysis in the NREC studies, the analysis does not support the predicted abilities to *reinstate* production because of the limitations in the data categories. Oddly enough, the PARM model appears to have now been withdrawn in favour of a more simplified model.

It is also pertinent here that there have been noticeable failings in the ability of the United States Civil Defense organization to deal with short-term, low casualty-producing domestic disasters. An example, which it was possible to watch develop in detail day by day, took place in St. Charles, Missouri in 1967, when the rising of the Mississippi caused flooding in certain sections of the city. The rise of the river was anticipated, due to upstream rainstorms, and its exact peak crest, height and time estimated 2–3 weeks beforehand. Low points where flooding would occur were known. The means for dealing with the problem: partial civilian evacuation, constant patrolling of the dikes, construction of dikes, sandbagging, were well known. Here one had a single well-defined engineering problem, with a warning period and time to prepare for the emergency, yet the performance was publicly recognized as having been grossly inadequate, and there were subsequent recriminations at the state house. At times in the developing emergency the state Civil Defense director ostensibly had overall authority to deal with the situation. There have been other such recorded

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instances, a hurricane in Oregon in 1963 in which power lines went down and transportation was disrupted and in which the Civil Defense organization proved to be incapable of coping effectively with the situation. One might argue that these examples should not necessarily be taken as definite tests: perhaps the organizational network was poor, perhaps the director was timid, perhaps the state militia or federal troops were insufficiently utilized—in short, perhaps a better, or optimum, performance could have been turned in. Nevertheless, all these human inadequacies would obtain in the post-attack environments as well, while these examples took place in peacetime with all the organizational decision-making machinery and means to carry out such decision intact.

We might make some isolated remarks here on the civil defence role in certain other nations. The example of the CD programme in Great Britain is an interesting one. It was maintained all through the years for domestic political reasons, to still the political pressures of the territorial (home) army, as it was the only task that could be given to that organization to do, and not because it was presumed that civil defence efforts would be of much utility in the case of nuclear attack on Great Britain. In 1968 when economic pressures forced the British government to terminate the territorial army, it terminated much of its CD programme by the very same act. German civil defence expenditures for an air shelter system have been quite heavy, in terms of proportion of its annual defence budget, for many years. One should also point out that the oft-discussed Swedish civil defence efforts do not occur in the same context as those of a nation with a nuclear offensive striking force.

All of this previous discussion has dealt with goods and material, surviving stocks and production capacity. The second criticism is more crucial, and here one can group the PARM studies with all the others. Nearly every study the author has seen assumes, implies, and requires a tremendously rationalized post-attack world. It is hard to believe that human life, personal dispositions and attitudes, would be like that following a thermonuclear exchange of any serious proportions. Numerous examples from the reports could be quoted here to make the point, expressions to the effect that such and such 'should' transpire, or 'will' take place. Behaviour is always ordered, relevant and therapeutic. The studies carried out concerning social organization or disorganization under stress that have been carried out by the Disaster Research Group of the National Academy of Sciences look at situations such as earthquakes, tornados, air crashes, and are orders of magnitude away from the effects, geographical ranges encompassed, and casualties that would ensue in a post-thermonuclear situation. In the former cases there has always been an 'outside' to supply food, medicine, psychological comfort and reconstructive potential, or if necessary to simply go about its business after a small sub-unit of itself might have been eradicated. These studies simply don't suffice; in fact, it is hard to believe that they are even relevant. A post-nuclear, or post-thermonuclear exchange situation in a major industrialized country is so wholly out of the range of previous experience that it is absolutely impossible, by any form of research, to produce any certain answers about the consequences.

It is probable that books dealing with two specific World War II phenomena, the concentration camps and Hiroshima, are more illustrative of the psychological pressures and human behaviour that might ensue. Examples of such books are: "Human Behaviour in the Concentration Camp" by Dr. Elie Cohen, and "Hiroshima," by John Hersey. One attempt in fact, to apply these lessons to CD and to the post-attack environment situation was made in the book and film by Peter Watkins, called "The War Game."

Such rare and isolated OCD contracted reports as 'Vulnerabilities of Social Structure, Studies of the Social Dimensions of Nuclear Attack', by Human Sciences Research Inc. clearly indicate that satisfactory information about the *social* effects of nuclear attack are not known, and makes clear the degree of our ignorance in this area: 'There are many ways for society to fail to achieve recovery goals and only a few for it to succeed. It is problematical that it could succeed even with extensive prior preparation; it is unlikely that it could succeed without them.' To assert that social recovery is possible is to make a completely unwarranted assumption.

The requirements for an analogue to the PARM system, the description of a national social damage and social resources assessment system, requires fundamental extensions of only partially worked out social sicence techniques. It is not clear that all such requisites could be provided for. It is not clear that any sort of

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anticipatory planning or indoctrination could alleviate some of the psychological sequelae one can envisage resulting from mass destruction. The relationship of such psychological sequelae to the PARM type economic recovery programmes has never been raised. There does not seem to be a single study which deals with such psychological variables with any thoroughness or which even attempts to. These problems have the status of 'non-questions' in CD research; they just don't exist. It is not clear what the political or social cost of attempts to provide such extensive prior preparations would be to the combination of a Western democracy armed with strategic nuclear weapons. This is an element which does not necessarily enter into economic preparations for stockpiling. 'Social stockpiling' entails different social and political processes. What would be the effect of such programmes on the United States, Soviet Union Strategic confrontation via the tenor of the cold war? What would be the effects of such programmes on democratic societies? These last are of course the two most critical questions, aside from general questions of efficacy, that are omitted in the considerations of CD planning.

A society that was really prepared for nuclear warfare would be living in a state of siege. Some have speculated that public animosities towards a strategic opponent would be lower as a result of a massive urban CD programme. The understanding of this question cannot be arrived at by abstract logic or by wishful thinking. It is a matter of sociology; decision making processes of elites and of legislatures, and the mechanisms of imposing such decisions on a moderately educated electorate. The more modern human societies have been prepared for war, the closer they have been to war. What are these methods? Experience since 1900 has given us numerous instances at which to look for the answers. What are the implications of living in a state of seige? 'Systems analysis', which the United States strategic analysis makes much of, requires that when looking at one piece of a problem, one looks at all the other pieces with which it will interact. Whether an end likelihood, as a defence against which a particular proposal is suggested, is made more likely or less likely by the very proposal is surely the most pertinent related aspect. In the initiation, operation, maintenance and effects of that particular proposal—in this case civil defence—will it increase or decrease the chances for that end likelihood—which in this case is nuclear warfare—in a nation of 200 million, armed with nuclear weapons and a pervading domestic communications system? A careful analysis of domestic and international political consequences would show just how far the defensive preparation (CD), would go in producing the undesired end result; an example of the self-fulfiling prophecy. Yet these questions which are the basic, underlying constructs of civil defense programmes, are another group of 'non-questions' in CD research.

In 1965 the United States National Academy of Sciences National Research Council released 'Project Harbor Summary Report', a report by a summer study group on civil defence. The summer study has sixty-three 'participants' and eighty-eight 'briefers, consultants, observes'. The thousand-page, six-section, background report has never been released to the public. The six sections are entitled: Acceptance and Impact; Education and Training; Strategy and Tactics; Future Weapon and Weapon Effects; Immediate Survival; Post-attack Recovery. Few of the attendees brought with them positions sceptical of CD programmers, and there was consequently little adversary confrontation. Since there was subsequently serious criticism of the report in the scientific community, and among other things, questions on the degree to which the report reflected the material in the six-section reports, the Academy convened a second group in May 1967 to do an updating and revision of the original 27-page summary report, without any further great attention to new background material. There were twelve people in the group which met for two weeks. Only one person was invited in an 'adversary' role, and it cannot have been considered a very serious attempt to introduce reservations. As far as the sections dealing with 'Human Ecology' are concerned (pre-attack: Acceptance and Impact, Education and Training; post-attack: Post-attack Recovery) assumptions remained largely the same and the omissions largely the same as here described. The matter of post-attack recovery of natural ecosystems, plants and animals has not been discussed here. Here too there are large questions, but there is at least the possibility of doing some research, and though one has to make extrapolations, here at least one need not contend with the factors of human psychology nor the political requirements of a defence psychology in a peacetime democracy.

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The expenditure that would be required for an urban blast shelter effort has always been a major United States political consideration. If anything, this will be a matter of even greater significance in the forseeable future. Major Western nations are already showing severe strains over the diversion of resources from domestic needs to defence-related activities, both in terms of direct funding and of trained scientific manpower.

In conclusion. much has been written in the United States on the matter of the nuclear post-attack environment. Nearly all of it has been grossly optimistic, with a strong tendency to unrealism, in considering the economy bit by bit, in omitting a picture of the state of mind of the survivors and the resulting state of the social process, in omitting a consideration of the interaction of these two factors, and in omitting a consideration of the effects of an extensive CD shelter programme on the strategic nuclear confrontation.

APPENDIX I

RECORD OF U.S. FEDERAL CIVIL DEFENSE APPROPRIATIONS, 1951–68

[Dollar amounts in millions]

Fiscal year	Requested	Granted
Former Federal Civil Defense Administration:		
1951	$403.0	$31.8
1952	535.0	75.3
1953	600.0	43.0
1954	150.0	46.5
1955	85.7	48.0
1956	75.4	68.7
1957	123.2	93.6
1958	130.0	39.3
1959	74.1	43.0
Former Office of Civil and Defense Mobilization:		
1960	101.7	52.9
1961	77.3	61.1
1962	104.5	86.6

Office of Civil Defense, Department of Defense:	Total requested	Amount needing authorizing legislation	Granted [1]
1962	$207.6	(0)	$207.6
			(49.6)
1963	695.0	(495.0)	113.0
1963-supp	61.9	(0)	15.0
1964	346.9	(195.0)	111.6
1965	358.0	(118.9)	105.2
1966	193.9	----------	106.8
1967			101.1
1968			110.0

[1] No funds granted for programs needing authosizing legislation due to lack of passage of such legislation.
[2] Transferred from OCDM appropriation to OCD/DOD.

Breakdown of Office of Civil Defense budget request, fiscal year 1966

Program element:	*Budget request*
1. Shelter survey	$36.3
2. Shelter development	3.0
3. Shelter in Federal buildings	7.8
4. Shelter provisions	52.6
5. Warning	1.3
6. Emergency operations	13.3
7. Financial assistance to States	30.5
8. Research and development	15.0
9. Management	14.6
10. Public information	4.0
11. Training and education	15.5
(1966) Total	193.9

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Appendix II—Remarks Concerning Civil Defense Made During Hearing Before the Committee on Armed Services of the United States [2]

G. CIVIL DEFENSE

The Civil Defense program proposed for fiscal year 1969 contemplates no important change in basic objectives from those which I discussed last year. However, we have held the fiscal year 1969 programme to the lowest possible sustaining rate, pending the end of the Vietnam conflict.

The major objective of the Civil Defense programme since 1961 has been the establishment of a comprehensive nationwide shelter system to help protect our population from radiological fall-out in the event of a nuclear attack. Most of this shelter is inherent in existing buildings but needs to be identified, marked and stocked with survival supplies before it can be considered truly useful. By the end of the current fiscal year we expect to have identified about 170 million spaces with a standard protection factor of 40 or more, of which about 101 million will have been marked and 55 million stocked with an average 14 days of supplies. Total shelter capacity should continue to grow in the future as a result of the continuing survey and design assistance efforts being conducted as part of the Civil Defense programme. In total, we can probably expect an additional 55 million spaces from these sources over the next five years.

A financial summary of the Civil Defense program, for which $77.3 million is requested for fiscal year 1969 is provided on Table 2 (not printed in the published testimony).

Question 303. The testimony states that $76,800,000 is being requested for Civil Defense. For years some have felt that the military policy of 'gradualism' we have followed in Vietnam, has over the years, permitted other countries, primarily the Soviet Union to equip North Vietnam with the most sophisticated defense weaponry ever known. The chief justification for this policy of 'gradualism'—a policy that has cost so much in lives and treasure—would seem to be apprehensive about doing something which would bring us into a nuclear exchange. It is clear from many reports that even a limited civilian defense set up would save tens of millions of Americans lives in a war. It is now somewhat paradoxical, therefore, that as the United States continues to escalate the action of this war, we nevertheless are asking for less than 1 per cent of the military budget for civil defense?

Answer. As the question correctly implies, all of our studies show that an effective nation-wide-fall-out shelter system would be, relatively, a highly efficient way of saving lives in a nuclear exchange. It was precisely because of this fact that the civil defense program was moved to the Department of Defense in 1961 and given new impetus. Since that time some 170 million spaces with a protection factor of 40 or more have been identified, of which 101 million have been marked and about 55 million stocked with an average 14 days of supplies. Ongoing programmes are expected to add some 55 million additional spaces over the next five years. In other words, we already have in being or under way a very large civil defense effort.

It is true, however, that even this amount of shelter will not provide fallout protection for all of the population at all times (because of geographical maldistribution of the shelters *vis a vis* the population and the need to have redundant shelter capacity to accommodate both the daytime and nighttime locations of the population). In the early 1960s, the Administration proposed to stimulate the creation of the needed shelter spaces through a programme of Federal subsidies designed to maximize the fallout protection potential of new construction. However, this proposal was not favorably received by the Congress. Since then the Defense Department has concentrated its efforts on the regular shelter survey programmes, including small and large structures and family homes.

As indicated in the Secretary's statement, the level of civil defense funding projected for FY 1969 does, in fact, reflect an ordering of priorities which calls for the program to be held 'to the lowest possible sustaining rate, pending the end of the Vietnam conflict. Considering the immediate nature of Vietnam requirements and what it is hoped is the relative unlikelihood of an all-out nuclear exchange, the priority accorded the former should not seem paradoxical.

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REFERENCES

1. Remarks concerning civil defense posture appearing in Authorization for Military Procurement, Research and Development, Fiscal Year 1969, and Reserve Strength. Hearings before the Committee on Armed Services, United States Senate, Ninetieth Congress, Second Session, on S. 3293. Feb. 1, 2, 5, 7, 15, 16, 20, 21, 27, 28, 29; March 4, 1968, page 341. U.S. Government Printing Office, Washington 1968.
2. Remarks concerning civil defense posture appearing in Authorization for Military Procurement, Research and Development, Fiscal Year 1969, and Reserve Strength. Hearings before the Committee on Armed Services, United States Senate, Ninetieth Congress, Second Session, on S. 3293. Feb. 1, 2, 5, 7, 15, 16, 20, 21, 27, 28, 29; March 4, 14, 1968, pages 129 and 409, U.S. Government Printing Office, Washington, 1968.

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BOEING AEROSPACE COMPANY

P.O. Box 3999
Seattle, Washington 98124

A Division of The Boeing Company

January 22, 1979

The Honorable William Proxmire
Chairman, Senate Banking Committee
United States Senate
Washington, D.C.

Dear Senator Proxmire:

Your request in recent hearings for an explanation of the discrepancy between our estimates and ACDA's estimates of Soviet losses in a nuclear war is clearly important and warrants a clear and candid answer. Unfortunately, Mr. Spurgeon Keeny, the Deputy Director of ACDA, chose to incorrectly represent our work. I appreciate the opportunity to set the record straight and to point out what we have determined to be the factors contributing significantly to the differences between the two estimates.

Population Protection

In his attempt to discredit our work, Mr. Keeny incorrectly inferred that this work was based on mere "assumptions" and "simple ratios." In fact, our approach was to analytically duplicate the provisions of the Soviet Union's civil defense plans and preparations. This effort was supported by extensive research into Soviet literature, use of rigorous system engineering functional analysis techniques, and a program of testing to establish the effectiveness of Soviet shelters and industrial protection methods. Moreover, the impact of uncertainties and possible imperfections in Soviet execution of their plans were examined parametrically.

Mr. Keeny's statement that we "assumed there would be no casualties from fallout" is false. The record of hearings before the Joint Committee on Defense Production (November 17, 1976) clearly shows that the data presented counted as fatalities all persons receiving a radiation dose of 200 rads or more. Moreover, our more recent studies of which ACDA is aware have treated this value parametrically.

By protecting their people against fallout, the Soviets can substantially limit their population fatalities. Figure 1 shows that even very rudimentary protection, such as basements or expedient shelters, is sufficient to minimize fatalities. In the ACDA analysis, the majority of the evacuees were assumed to have a protection factor of 10 or less, which results in enormously high fatalities compared to what the Soviets could achieve if they carry out even the most modest of the measures outlined in their plans and literature.

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Assumption Variables Versus U.S.S.R. Civil Defense Effectiveness

Degree of Fallout Protection for Evacuees and Rural Population

FIGURE 1

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Mr. Keeny has incorrectly characterized our treatment of blast protection. In their cities, the Soviets are building industrial shelters and apartment basement shelters with a blast resistance of at least 150 psi and 60 psi, respectively. These ratings were calculated for the Defense Nuclear Agency based on knowledge of construction details such as beam dimensions, concrete quality, and structural reinforcement size and placement. The Soviet designs for expedient shelters have been built and extensively tested in the United States. Based on these tests, we rate these shelters at 15 psi to 50 psi blast resistance.

Mr. Keeny also misrepresents our treatment of population distribution. Soviet plans call for leaving half of the critical workers sheltered in the cities and evacuating the remaining urban population to the collective farms and outlying villages. We estimate that half of the Soviet 1985 "critical" work force will be 17 million persons or 12 percent of the urban population, a figure consistent with the minimum estimates of Soviet urban shelter capacity. The urban evacuees plus the people already living in the 2.3 million square miles of agricultural area and villages total 203 million people. It is not necessary, as Mr. Keeny infers, to evacuate Muscovites as far as Vladivostok. Figure 2 shows that an average evacuation distance of about 40 miles is all that is required. Moscow, the largest city, would involve the greatest evacuation distance, about 160 miles.

The remaining Russians, the data source we used indicated about 61 million, are distributed over about 6 million square miles. We did not, as Mr. Keeny states, simply "put aside" these latter people; to have targeted such thinly distributed (10 per square mile) people would have reduced Soviet casualties.

As to the reasons why our results differ from those produced by ACDA: ACDA assumed that 30 percent of the Soviet urban population would not be evacuated but that the good quality shelters would accommodate only 10 percent. Thus, 20 percent of the Soviet urban population was assumed unevacuated and inadequately protected, which of course subjects them to massive losses. The Soviet plans, which we endeavored to represent in our analysis, indicates that urban residents not sheltered will be evacuated.

A second difference centers around the way in which the Soviets choose to distribute and provide blast protection for their evacuees. The ACDA analysis assumed that the Soviets would cluster their evacuees in hosting areas, which we estimate could result in some concentrations as high as 500 persons per square mile. The evacuees were assumed to have no blast protection, so fatalities would occur at 3 to 7 psi according to the source used by ACDA. Figure 3 shows that a distribution of 500 persons per square mile and 3 psi fatal blast level results in a fatality level almost 100 times greater than a uniform distribution and blast protection to 15 psi (the minimum provided by Soviet expedient shelters). It is important to remember that it is the Soviet Union and not the United States that controls such factors as evacuation, distribution, and sheltering of the Soviet citizens.

Industrial Protection

There is little disagreement that the U.S. arsenal could destroy the Soviet industrial base if the Soviets do nothing to protect it. The figures cited by Mr. Keeny are based on this assumption. The issue is whether the Soviets would or could protect industry.

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Assumption Variables Versus U.S.S.R. Civil Defense Effectiveness

Distance Evacuated

FIGURE 2

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Assumption Variables Versus U.S.S.R. Civil Defense Effectiveness

Blast Protection Provided Evacuees and Rural Population

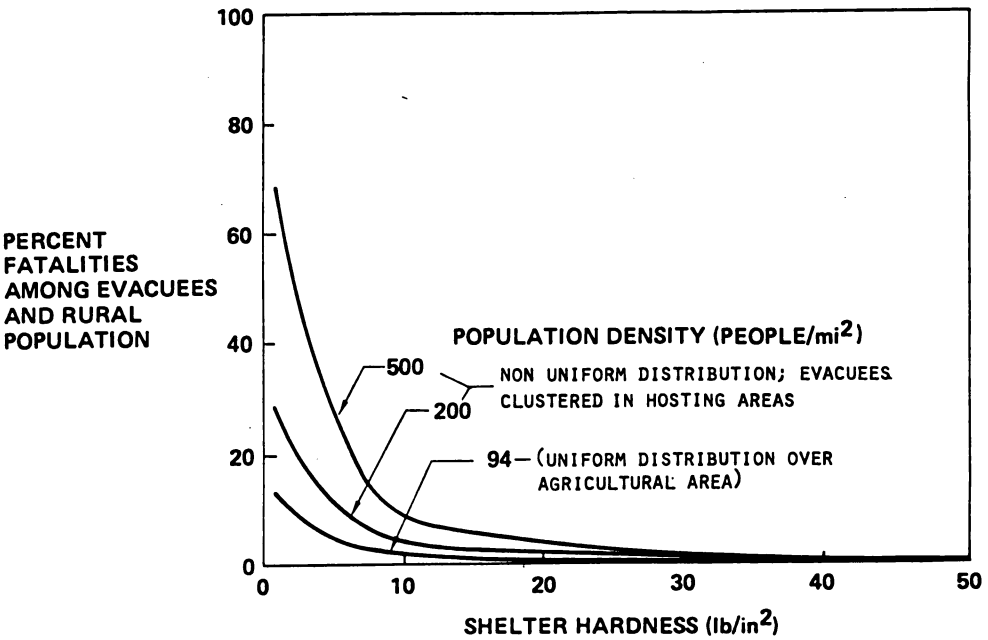


FIGURE 3

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Mr. Keeny is not alone in pointing out that there is little evidence of Soviet industrial hardening. As our recent inability to forecast events in Iran has shown, however, "little evidence" does not always prove that no problem exists. Our report to the Joint Committee on Defense Production noted that the preparatory measures for industrial hardening are not easily detectable by U.S. intelligence collection methods. Moreover, even if the Soviets have done no preparations beyond research and planning, they could surge to a fully protected posture within 6 to 8 weeks.

Mr. Keeny implies that Soviet protective methods are applicable to only "a lathe or heavy equipment." Such is not the case. Our tests have shown that such fragile items as computers, calculators, and electronic test equipment can be protected against very high blast pressures (300 psi). Thus, there is no substance to Mr. Keeny's assertion that "even the most ingenious people" will be unable to find a way to protect light industry.

The claim that the Soviets are not dispersing their industry is a product of the questionable assumption that they will not harden it. If the Soviets do not carry out their plans to harden their industry, it is not sufficiently dispersed but hardening decreases the separation distance needed to get the benefits of dispersal. For example, with hardening the Soviets would have to space adjacent facilities only 2000 feet apart, compared to 8000 feet without hardening (based on average-yield, accurate U.S. warheads).

The ACDA study of industrial protection, which I have reviewed, is not a competent work. The hardness levels known to be achievable on industrial components are seriously understated while the difficulty of achieving these levels is overstated. The resiliency of industry in recovering from damage is disregarded. The report's fixation on the capability of one-megaton weapons to damage industry is misleading since the U.S. would be able to deliver few of these weapons against Soviet targets. Moreover, the ACDA study fails to assess the impact of protection on the survival and recovery of the Soviet industrial base as a whole.

The difference between our results and those cited by Mr. Keeny arise from fundamental differences in approach. We looked for solutions, while ACDA looked for problems. When provisions of Soviet civil defense plans were within their control and capability, we credited them with the protection of these provisions. The ACDA analysis implicitly assumes that the Soviets will incompetently plan and badly execute their civil defenses. To determine whether a particular type of factory could be protected and recover, we engaged the services of experts with proven competence in building, maintaining, and operating that type of factory. Because no one has tried to find a way to protect, for example, refineries, Mr. Keeny asserts that even ingenious people will not be able to find a way.

In my judgment, it would be inappropriate to base U.S. security decisions on the hope that the USSR will bungle a program to which they have assigned personnel known to be competent and in which they are investing twenty times as much as is the U.S.

T. K. Jones

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UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY
WASHINGTON

February 23, 1979

OFFICE OF
THE DEPUTY DIRECTOR

Dear Senator Proxmire,

Thank you very much for permitting me to respond to Mr. T. K. Jones' letter to you dated January 22, 1979, concerning my testimony before your Committee on January 8, 1979. The material contained in Mr. Jones' letter does not in any way cause me to modify the statements I made before your Committee concerning his study or the ACDA study on Soviet fatalities in nuclear war. In my reply, I will first address, in more detail than I did during the hearings in response to your questions, the central theme of Mr. Jones' study -- e.g., that an all-out nuclear war would cause no more than about 10 million Soviet fatalities. Then I will examine the specific points Mr. Jones raised in his letter to you.

In his testimony before your Committee on November 17, 1976, Mr. Jones actually stated that "...98 percent of the Soviet population would survive..." or 5 million would be fatalities in an all-out nuclear war. Although he did not explain the methodology by which he arrived at this remarkable conclusion, we have been able to evaluate the methodology in his subsequent study, Effect of Evacuation and Sheltering on Potential Fatalities from a Nuclear Exchange, August 15, 1977, which asserts, "Full evacuation using Soviet civil defense guidelines coupled with expedient shelters reduces fatalities to about 10 million." It is this report which is apparently the analytical basis for the widely repeated assertion that there would be only 10 million Soviet fatalities in a nuclear war.

The methodology by which Mr. Jones arrives at his result apparently is as follows. Taking the Soviet population at 280 million and the area of the Soviet Union at 8.6 million square miles, he then makes the following assumptions.

The Honorable William Proxmire
Chairman, Senate Banking Committee

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Assumption 1. 61 million people are estimated to be uniformly scattered over the 6.3 million square miles of the least inhabited rural part of the Soviet Union. These 61 million people are simply left out of his calculations.

Assumption 2. 87 percent of the 139 million people living in the cities are evacuated and they as well as the remaining 80 million rural people are all uniformly scattered over the remaining 2.3 million square miles of the Soviet Union. The 17.4 million people that remain in the cities are uniformly sheltered in the 14,100 square miles of urban area.

Assumption 3. All the people that remain in the cities are protected by 150 psi shelters with fallout protection, PF of 6,000. All the people in the evacuated areas are protected by 7 psi shelters with fallout protection, PF of 200.

Assumption 4. The entire U.S. retaliatory attack with the weapons that survive a Soviet first strike are used in a barrage attack on the Soviet Union. This attack could cover an area of 2,900 square miles with 150 psi overpressure and an area of 92,000 square miles with 7 psi overpressure.

Based on these assumptions, Mr. Jones makes the following calculations:

1. The total urban fatalities in the urban areas are computed by taking the ratio of the 150 psi lethal area to the total urban area (2,900/14,100) and then multiplying it by the number of persons remaining in the cities after 87 percent have evacuated (139 x .13) = 17.4 million). The total number of urban fatalities obtained by this procedure is 3.58 million.

2. Rural fatalities are computed in a similar manner. The lethal area in the rural area is 92,000 square miles minus the 14,100 square miles of city area or 77,900 square miles. This is divided by the total rural area of 2.3 million square miles and multiplied by the total number of persons (280 minus 61 that are excluded by assumption #1 minus 17.4 that remain in the cities for a total of 201.6 million). This procedure leads to a total of 6.68 million rural fatalities.

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3. The number of fatalities obtained from the procedure then are 3.58 million urban plus 6.68 million rural for a total of 10.3 million.

The problem with this procedure is simply that the four basic assumptions are invalid. In particular, the first two assumptions that drive the results need to be examined. Mr. Jones does not cite a data source for assumption #1, an assumption which is incorrect as there are not 61 million people scattered over the 6.3 million square miles that are located outside the 2.3 million square miles of the rural and urban areas of the Soviet Union. This 6.3 million square miles is in fact essentially uninhabited. The second assumption that people are uniformly spread over the urban and rural areas is totally unrealistic since it completely disregards the fact that population is distributed in a highly non-uniform manner. No evacuation plan can distribute the population uniformly over the entire area.

With regard to assumption #3, Mr. Jones in his study grossly exaggerates the number of shelter spaces, the hardness of the shelters and the fallout protection in both the urban and the rural areas. He ignores the intelligence data on numbers and hardnesses of shelters; and, with respect to fallout protection, he ignores human behavior and the habitability of the shelters. Finally, assumption #4 represents a very inefficient way to apply weapons in an attack. A barrage attack implies little or no knowledge of the targets under attack. This would not, of course, be the case in a U.S. retaliation against the Soviet Union.

Nevertheless, if we accept Mr. Jones' invalid third and fourth assumptions and redo his calculations taking into account the actual distributions of urban and rural populations, we obtain a totally different answer which indicates that the consequences of nuclear war are far more serious than Mr. Jones suggests.

From our knowledge of the non-uniformity of the urban population, we know that the densest 2,900 square miles of the total urban area contains 80 percent of the urban population as opposed to 21 percent when it is assumed that persons are spread out uniformly over the entire area. Therefore, the number of urban fatalities from this one change would increase to almost 14 million compared to less than 4 million in the Jones' calculations.

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With respect to rural fatalities, a realistic calculation would first of all include the 61 million persons excluded in Mr. Jones' calculation to give a total of 262.6 million rural residents and evacuees. Again on the basis of how the rural population is actually distributed and assuming that the hosting of evacuees will keep the distribution proportionately unchanged, our data shows that 77,900 square miles of rural area contains 18 percent of the ex-urban population. Lethal overpressure placed over this most densely populated area by U.S. retaliatory weapons would produce about 47 million fatalities as compared to less than 7 million under Mr. Jones' assumptions.

Thus with changes only in the distribution of population Mr. Jones' 10 million fatalities become 61 million.

The fallacy of assuming a uniform density throughout the Soviet Union of 86 persons per square mile after evacuation has taken place can be further illustrated by the following example. The table below presents the population in the 10 most populated areas of the U.S.S.R. The table shows that the densities stay far above the 86 per square mile of the Jones study for this large segment of the Soviet population.

Population Density to 57.5 statute miles (50 nautical miles) Radius Circle Around Each of the 10 Most Populated Soviet Areas

City	Persons per Square Mile	Cumulative Population (millions)	Cumulative Area (sq. miles)
Moscow	1,263	13	10,446
Leningrad	497	18	20,892
Tashkent	378	22	31,337
Kiev	371	26	41,783
Kharkov	296	29	52,229
Tbilisi	266	32	62,675
Gorky	242	35	73,121
Kuibyshev	236	37	83,567
Minsk	227	39	94,012
Sverdlovsk	208	42	104,458

The data in this table is by itself sufficient to disprove the 10 million fatalities from the Jones study. Of the 42 million people in these ten areas, 25 million live in the cities, a total area less than 1,500 square miles,

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and the other 17 million live in the surrounding areas around these cities. If we now make Mr. Jones' assumption that 87 percent evacuate and the remaining 13 percent are sheltered to 150 psi, we find 3 million sheltered in the cities and 39 million in the rural areas. If we now do Mr. Jones' simplistic barrage attack calculations with only one-half of the U.S. retaliatory capability, we would have a 150 psi overpressure coverage of 2,900/2 = 1,450 square miles and a 7 psi overpressure of 92,000/2-1,450 = 44,550 square miles. These overpressures would then result in 3 million urban fatalities plus 44,550/104,000 x 39 million or 17 million rural fatalities for a total of 20 million fatalities. This simple example illustrates that with only 1/2 of the U.S. forces targeted against the 10 largest cities, 20 million persons can be killed even if Mr. Jones' methodology is used. Through these two illustrations - the 20 million fatalities by merely barraging the area around 10 of the largest cities or the 61 million fatalities by taking into account where the people actually live -I hope to have shed some light on the quality of Mr. Jones' estimates.

While I have used Mr. Jones' methodology in these examples to illuminate the issue, simplistic methods such as his cannot adequately simulate the cataclysmic losses that nuclear war would bring to the Soviet Union. There are, of course, recognized uncertainties in our own simulations and gaps in our own knowledge of Soviet civil defense. We continue to believe, however, that our estimate of 25 to 35 million Soviet fatalities in the first few weeks following a nuclear exchange is a reasonable lower bound from the short-term effects assuming no efforts were made by the U.S. to target population per se. There is no doubt in my mind that the actual fatalities would be much higher even in this case. As I explained in my testimony the short-term fatalities could be made much higher if we were to ground burst our weapons or actually target population.

The letter from Mr. T. K. Jones contains several incorrect statements to which I will take this opportunity to respond:

-- Mr. Jones incorrectly describes the degree of sophistication of his analysis. The calculations by Mr. Jones are simple aggregations in every respect. He combines all U.S. retaliatory weapons into a single figure of merit,

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lethal square miles, and he characterizes the Soviet population as being uniformly distributed either within the urban area or over the rural area. He then multiplies the area of lethality by the persons per square mile to obtain the number of fatalities. Calculations made on this basis belie his assertion that "rigorous system engineering functional analysis techniques" were used to derive the 10 million fatality result or that he analytically duplicated the Soviet civil defense program.

-- Mr. Jones is incorrect when he says that he was falsely accused of assuming there would be no casualties from fallout. I stand on my previous remarks which addressed the much publicized 10 million fatalities. The most recent Jones study, to our knowledge, Effect of Evacuation and Sheltering on Potential Fatalities from a Nuclear Exchange, August 15, 1977, contains the minimum estimate of 10.3 million Soviet fatalities. All of these fatalities were caused by blast in his calculations. It is true that other cases considered fallout but in none of those cases were the fatalities as low as 10 million.

-- Mr. Jones misrepresents the ACDA analysis. He confuses the protection factor of a structure with the effective protection factor of a person. ACDA, as the Defense Civil Preparedness Agency recommends, took population behavior into account. When variables that influence human behavior, such as time spent outside each day and total shelter stay, are factored in, the effective protection factors are found to be much smaller.

-- Mr. Jones' statement concerning Soviet blast protection is inaccurate. I know of no source which states that Soviet industrial shelters are at least 150 psi and that basement shelters are at least 60 psi. Moreover, the structural components he mentioned did not include blast doors and ventilation systems. At issue is the protection afforded the people inside the shelters not how well parts of the shelters survive.

-- Mr. Jones evades the inaccuracy of his population distribution methodology. The evacuation area around each city cannot merely be enlarged to the point where the population is uniformly distributed at less than 100 persons per square mile. To do this would cause overlap of the people from different cities. Thus it is entirely unreasonable to assume a uniform distribution of rural and urban evacuees.

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-- Mr. Jones' statement about the "missing" 61 million persons is incorrect. He did put aside 61 million persons in his calculations. Of course, one would not attempt to barrage an area of 6.3 million square miles if 61 million persons were uniformly distributed over that area at 10 persons per square mile. However, our data source, the DOD population data base, says that more than 6 million square miles are essentially uninhabited and, therefore, the 61 million persons should not have been subtracted from the total rural population and set aside by Mr. Jones. If he has a better data source, it should be identified.

-- Mr. Jones' statement about ACDA study assumptions are incorrect. The most recent ACDA study, of which Mr. Jones has a copy, assumed that 80 percent of the Soviet urban population evacuated. Of the remaining 20 percent half were assumed to be in hardened shelters and the other half in basements. The assumptions are clearly stated in the study.

-- Mr. Jones incorrectly implies that the ACDA results were driven by the assumed blast protection of evacuees. The 25 to 35 million fatalities in the ACDA study did not include any rural or evacuee fatalities from blast. All ex-urban deaths were caused by fallout.

-- Mr. Jones believes we should give the Soviets credit for a fully protected economy despite the lack of supporting evidence. The results of a few tests in the United States on isolated pieces of equipment cannot be extrapolated to the entire Soviet economy. Such tests also ignore the radioactivity that would be present. It is one thing to protect as much as one shop by wrapping, cushioning, and burying the equipment and another matter to protect thousands of complex and interdependent economic facilities.

-- Mr. Jones would have us believe that industrial dispersal is taking place right before our eyes by virtue of their hardening efforts which according to Mr. Jones would allow facilities to be in close proximity. This is pure conjecture, unsupported by evidence.

-- Mr. Jones claims that the difference in results is due to our assumption that the Soviets will incompetently plan and badly execute their civil defenses. This is an incorrect observation. Our range of outcomes take into account different levels of protection and reflect reasonable assumptions.

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In summary, I stand behind my original testimony before your Committee and the findings of the ACDA study. If anything, the ACDA study has leaned towards overestimating the capabilities of the Soviet civil defense posture in an effort to describe the lower bound on Soviet fatalities in the event a massive urban evacuation was carried out. Similar studies performed by the Department of Defense result in much larger Soviet losses than those presented in the ACDA study. For example, in Table 2 of Dr. Huntington's testimony he notes Soviet fatalities in the evacuated case to range from 25 to 55 million. The 25 million lower limit came from the ACDA study while the upper limit of 55 million came from the Department of Defense study. This is a clear indication of the conservative assumptions made in the ACDA study and a further repudiation of the estimate presented by Mr. Jones.

Yours truly,

Spurgeon M. Keeny, Jr.

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STATEMENT OF DR. LEON GOURE, ASSOCIATE DIRECTOR ADVANCED INTERNATIONAL STUDIES INSTITUTE, IN ASSOCIATION WITH THE UNIVERSITY OF MIAMI

THE ADMINISTRATION'S CIVIL DEFENSE PROGRAM

On November 12, 1978 the Administration announced that it was ready to propose a long-term, albeit modest, program to enhance the capability of the U.S. to protect its population in the event of a nuclear war. Undoubtedly this decision is controversial and will result in a great deal of debate over the questions of the value of civil defense in general and the proposed program in particular. Indeed there are three interrelated areas of controversy: (1) the possibility of national survival in the event of a nuclear war in general and the contributions which civil defense measures can make to that end; (2) the implications of the large and compehensive Soviet civil defense program and war-survival capabilities for the U.S.-Soviet strategic balance, the credibility in Soviet eyes of the U.S. deterence strategy, as well as for crisis management and war-fighting, and (3) finally the particular utility and effectiveness of the program proposed by the Administration.

Numerous studies and analyses of various levels of possible enemy nuclear attack from the present through the mid-1980's have shown that despite the tremendous destructive power of modern nuclear weapons, it is possible to insure national survival and reduce population losses to 10–20 percent as against the present expected loss among the unprotected American population of some 140 million (64 percent), possibly rising to 160 million (72 percent) by 1985. While the problem of providing effective protection for the population and insuring rapid post-war recovery is complex, it is more a matter of resource allocation than a technical problem. Of course, the implementation of an effective civil defense program requires a great deal of time, but its potential impact on losses and rates of recovery can be dramatic.

Various people in this country argue that a nuclear war is "unthinkable" and consequently that a U.S. civil defense program is unnecessary, or that it could be "destabilizing" even if the Soviet Union has such a massive civil defense program of its own. Others strongly insist, all studies to the contrary, that there can be no survival in a nuclear war. Yet, neither one nor the other group completely discounts the possibility of a nuclear war occurring, given the rivalry between the Soviet and the Western blocs, and the possibilities of miscalculation or inadvertent escalation of crises and local conflicts. In other words, the possible occurrence of an all-out nuclear war is a low probability event, but not impossible despite U.S. deterrence. Indeed, the Secretary of Defense, Dr. Harold Brown, has pointed out in the Annual Report of the Defense Department for Fiscal Year 1979 that we are uncertain about what deters the Soviet Union, or whether our deterrence posture and strategy appear credible to the Kremlin, even if it appears that way to ourselves.

At the present time the U.S. deterrence posture and strategy is essentially punitive, i.e., it threatens to inflict major damage on the Soviet Union, but U.S. offensive operations would not preserve the life of a single American or help limit the damage which the Soviet Union can inflict on this country. Meanwhile, Brezhnev has acknowledged in May that the Soviet Union does have a civil defense program, and that Soviet capabilities to protect the Soviet population and economy from attack are being further improved. He called this a "humanitarian" program. By contrast the United States, which prides itself on its humanitarian values, not only leaves its population and country hostage to the Soviets, but bases its entire deterrence and war-fighting concept on how many Soviet citizens it can kill and how much damage it can inflict on the Soviet Union, with no regard for the devastation the Soviets can cause in the United States. As a result. Soviet spokesmen are persistently claiming that the United States, despite its military power, is incapable of achieving its strategic or political objectives, be they global or regional, because its risks its own destruction.

To be credible a deterrent must accord with what the side being deterred regards as being rational and militarily-politically useful. The Soviet Union naturally believes that its strategic posture is the most rational and logical in the nuclear age, and it tends to judge the credibility of the U.S. deterrence capability and strategy in that light. The Soviet Union regards civil defense as an essential integral element of its strategic posture, as being a "factor of great strategic significance" which in a large measure can determine the out-

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come of a war and which signficantly reinforces the credibility of Soviet strategic deterrence. Soviet spokesmen have noted the lack of a U.S. civil defense capability and point up the vulnerability of the United States to Soviet strategic targeting. According to Soviet strategic doctrine the priority targets include: the strategic and military forces of the United States, the defense and defense related industries, governmental and military command, control and communications, and finally other elements of the economy which may be used to rebuild a U.S. war-fighting capability. Even with this clearly spelled out Soviet targeting doctrine, the United States has done next to nothing to protect its military forces and installations or residents near such installations, or its defense industries and strategic stockpiles, and relatively little has been done to insure the survival of government, especially at state and local levels, not to mention the population in potential target areas. By contrast, the Soviets do protect their leadership elements, their military forces, industrial labor and other valuable elements of the population. They have blast shelters for a large proportion of the residents in the larger cities and they have and continue to carry out measures to protect important elements of their economy against nuclear strikes. The recently published CIA Report "Soviet Civil Defense," for all of its inaccuracies, does note that if the Soviets decide to go to war and implement their civil defense measures, Soviet losses may be kept to the "low tens of millions," only half of which would be fatalities. In other words, the report finds that the Soviets may lose some 10 to 20 million killed as a result of U.S. retaliatory strikes as against 140–160 million in the United States. Naturally, the Soviet Union expects to suffer extensive damage from U.S. retaliatory strikes, but the CIA report indicates that the Soviet leadership could come to have considerable confidence that the Soviet Union and its system would survive. Of course, the present Soviet civil defense capability benefits from some 30 years of cumulative efforts to create the means and methods to reserve Soviet survival. And in future crises situations this Soviet civil defense capability could be used to pressure the United States, influence U.S. public opinion, and place the United States in a very unfavorable negotiatory position. Indeed, three successive Secretaries of Defense have expressed concern over the adverse impact of the Soviet civil defense program on U.S. deterrence and on possible Soviet risk calculations in crises situations.

The point is that an effective program to insure the national survival of the United States would significantly add to the credibility of the U.S. deterrence posture in Soviet eyes, lessen the vulnerability of this country to possible Soviet nuclear blackmail in crises situations, and provide for national survival in the event that deterrence fails. Indeed, given that the United States is committed to a retaliatory strategy, which leaves to the Soviet Union the option of the first strike, there is an even greater requirement for a meaningful civil defense program for this country than in the Soviet Union.

The question raised by the recent Administration's announcement of plans to enhance the U.S. capability to protect its population raises, however, the question whether such a program would provide the United States with a meaningful national survival capability or whether it is merely a palliative not intended to create serious survival capability. The Administration has not spelled out its proposed program in detail, but it is known that it consists primarily of a seven-year program to develop the capability to evacuate and disperse the major part of the U.S. urban population in a crisis. According to reports, such a program may cost a total of some $2 billion or about $1.3 per person per year, i.e., far less than is spent by the communist countries including the Soviet Union and China, or by some of the NATO countries such as Norway, or some of the neutrals such as Sweden and Switzerland.

The critical question with the proposed program is whether it is designed primarily for show in a crisis, i.e., as a response to Soviet urban evacuation, in which a negotiated settlement is most likely, or whether it is intended as a serious measure to insure the survival of our population and country should the crisis escalate and deterrence fail. In the first case, assuming that a large proportion of the urban residents would leave the cities, it is only a question of caring for their immediate needs wherever they are dispersed to until the crisis passes. In the second case, a variety of plans, preparations and measures are needed to insure that once dispersed the population will be protected against radio-active fall out and will be taken care of for an indefinite period of time. The difference in what such programs would be in terms of population survival is very large.

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A mere paper planning program for crisis relocation, without serious preparatory measures, public education, stockpiling of needed equipment and training of a certain number of people may cut U.S. losses by half, since people would not be exposed to the direct effects of the large Soviet warheads, but the U.S. would still stand to lose some 70 to 90 million people. With serious preparations and education, and always providing that there is sufficient time to carry out the crisis relocation of the population, calculations show that 80 percent or more of the U.S. population could survive an all-out Soviet attack. (It is assumed that 10–20 percent of the urban population would refuse to leave even under threat of attack.) In other words, crisis relocation by itself, especially if it is limited to planning only, is by no means the whole solution to the problem of national survival. Furthermore, while the development of plans alone would reduce casualties, any program which faces the United States with the prospect of 70 to 90 million fatalities would do little to enhance the credibility or utility of the U.S. deterrence posture or effectively reduce U.S. vulnerability to Soviet nuclear blackmail in a crisis situation. Of course, the crisis relocation program does nothing to improve the survival of U.S. industries or of military personnel and installations targeted by the Soviet Union, nor will it work in the event of a Soviet surprise attack.

For all of it complexities, crisis relocation is one of the easier and cheaper methods for insuring the survival of the vast majority of the American population. This requires more, however, than merely moving people out of potential targets for attack. Among other things it requires careful surveys and preparation of the host areas, preparation for the rapid upgrading of potential fall out shelters and readiness to build additional ones, the stocking of shelters with food and water, the provision of radiation monitoring equipment and training a large number of persons in their use, provision of shelter ventilation kits, the training of a large number of shelter managers, the preparation of a large number of emergency operating centers, additional surveys and marking of fall out shelters in the cities, public information and education, and so on. Short of that the crisis relocation program would offer the population little more than an outing with little capability to insure its survival if a war occurs.

Civil defense is not a gimmick and will not achieve its purpose either of strengthening deterrence or as insurance in the event deterrence fails if it is treated as such. Since by necessity civil defense must be a long-term program it should have no bearing on the issue of the signing at this time of a SALT agreement or whether or not it is ratified by Congress. Indeed, the rationale for a meaningful civil defense program for the United States is quite independent of any arms control agreement on limiting offensive strategic weapons. After all, SALT does not deal with the total strategic posture of either side. And it is much too late to seek agreements on limiting both sides' war-survival capabilities. Aside from the fact that Soviet compliance with such an agreement could not be verified, and that the Soviets clearly proclaim their intention not to limit their efforts, the Soviet Union has already attained a formidable capability in this area, and to restrict U.S. efforts to achieve an effective civil defense program would merely perpetuate an important asymmetry in the relative strategic postures and vulnerabilities of the United States and USSR.

A meaningful U.S. civil defense program requires a long-term commitment of efforts and funds. It will not achieve its purpose if it becomes an annual budgetary football. As insurance programs go, it is very cheap indeed. The average American family and individual spend hundreds of dollars each year on insurance against low probability disasters such as killing someone while driving, fire, permanent disability, etc. Yet, even the most ambitious program would cost only some $30 per person per year, and the one proposed by the Administration would cost less than $2 per person per year, which is a small price indeed for national survival and insuring the lives of some 170 to 180 million Americans.

Even so, to sustain the program in the long haul it must be viewed as an integral part of the U.S. defense posture and as essential for U.S. national security. Furthermore, to be credible to both the American people and the Soviet Union, U.S. civil defense should have a stature appropriate for such a program and this stature should reflect the Administration's commitment to such a large and important effort. I personally regret, therefore, the Administration's plan to submerge the Defense Civil Preparedness Agency (DCPA) in the new Federal Emergency Management Administration. I believe this will tend to weaken

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the proposed program's credibility. In the Soviet Union civil defense is headed by a Deputy Minister of Defense and it ranks on a par with the other services of the Soviet Armed Forces. It is also difficult to perceive civil defense as an integral part of the U.S. defense program if it is taken out of the Department of Defense. Furthermore, there is the question of the leadership of the program. Disaster, be it natural or war-made, is too serious a business to be left to amateurs no matter how well meaning. DCPA has been treated cavalierly for too many years. If the Administration continues such practices it is difficult to see how Congress, the state and local governments, the American public or for that matter, the Soviets would take the proposed program seriously. Indeed, the choice of leadership of the proposed civil defense program will be another measure of the Administration's actual attitude to civil defense and the purpose such a program is intended to serve.

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